ORDER NO. ARD83040230C8-19

Service Manual

Cassette Deck

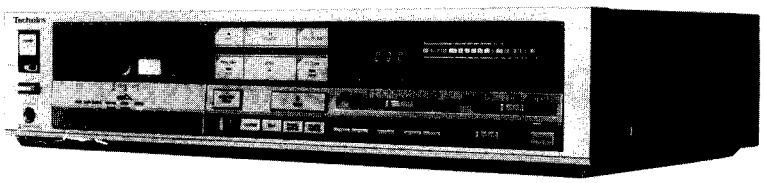
RS-M253X

(Silver Face
Black Face)

dbx/Dolby B-C 2 Motor 3 Head
Cassette Deck

DOLBY B•C NR

This is the Service Manual for the following areas.
[D] ..... For all European areas except United Kingdom.
[B] ..... For United Kingdom.
[N] ..... For Asia, Latin America, Middle East and Africa areas.
[A] ..... For Australia.



RS-M253X in black is also available in some countries.

RS-M250 MECHANISM SERIES

Specifications

Track system:	4-track 2-channel stereo recording and playback
Tape speed:	4.8cm/s
Wow and flutter:	0.04% (WRMS), ±0.14% (DIN)
Frequency response:	Metal tape; 20—22,000Hz 20—21,000Hz (DIN) 30—19,000Hz±3dB
	CrO_2 tape; 20—21,000Hz 20—20,000Hz (DIN) 30—18,000Hz±3dB
	Normal tape; 20—19,000Hz 20—18,000Hz (DIN) 30—17,000Hz±3dB
Dynamic range:	110dB (at 1kHz) with dbx* in
Max. input level improvement:	10dB or more improved with dbx in (at 1kHz)
Signal-to-noise ratio:	dbx in; 92dB Dolby** C NR in; 78dB (CCIR) Dolby B NR in; 70dB (CCIR) NR out; 60dB (Signal level = max. input level A weighted, CrO_2 type tape)
Fast forward and rewind time:	Approx. 90 seconds with C-60 cassette tape
Inputs:	MIC; sensitivity 0.25mV, applicable microphone impedance 600Ω—10kΩ LINE; sensitivity 60mV, input impedance 47kΩ or more
Outputs:	LINE; output level 400mV, output impedance 3.5kΩ or less HEADPHONES; output level 125mV (at 8Ω) applicable headphone impedance 8Ω—600Ω
Bias frequency:	85kHz
Heads:	3-head system 2-AX (AMORPHOUS) head for record/playback 1-double-gap sendust head for erasure
Motor:	2-motor system
Power requirements:	AC; 110/125/220/240V, 50-60Hz Pre-set power voltage; [D][N][A]; 220V [B]; 240V
Power consumption:	[D][B][A]; 25W [N]; 18W
Dimensions:	43cm(W)×9.76cm(H)×27.3cm(D)
Weight:	5.3kg

Design and specifications are subject to change without notice.
*The term dbx is a registered trademark of dbx Inc.
**'Dolby' and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

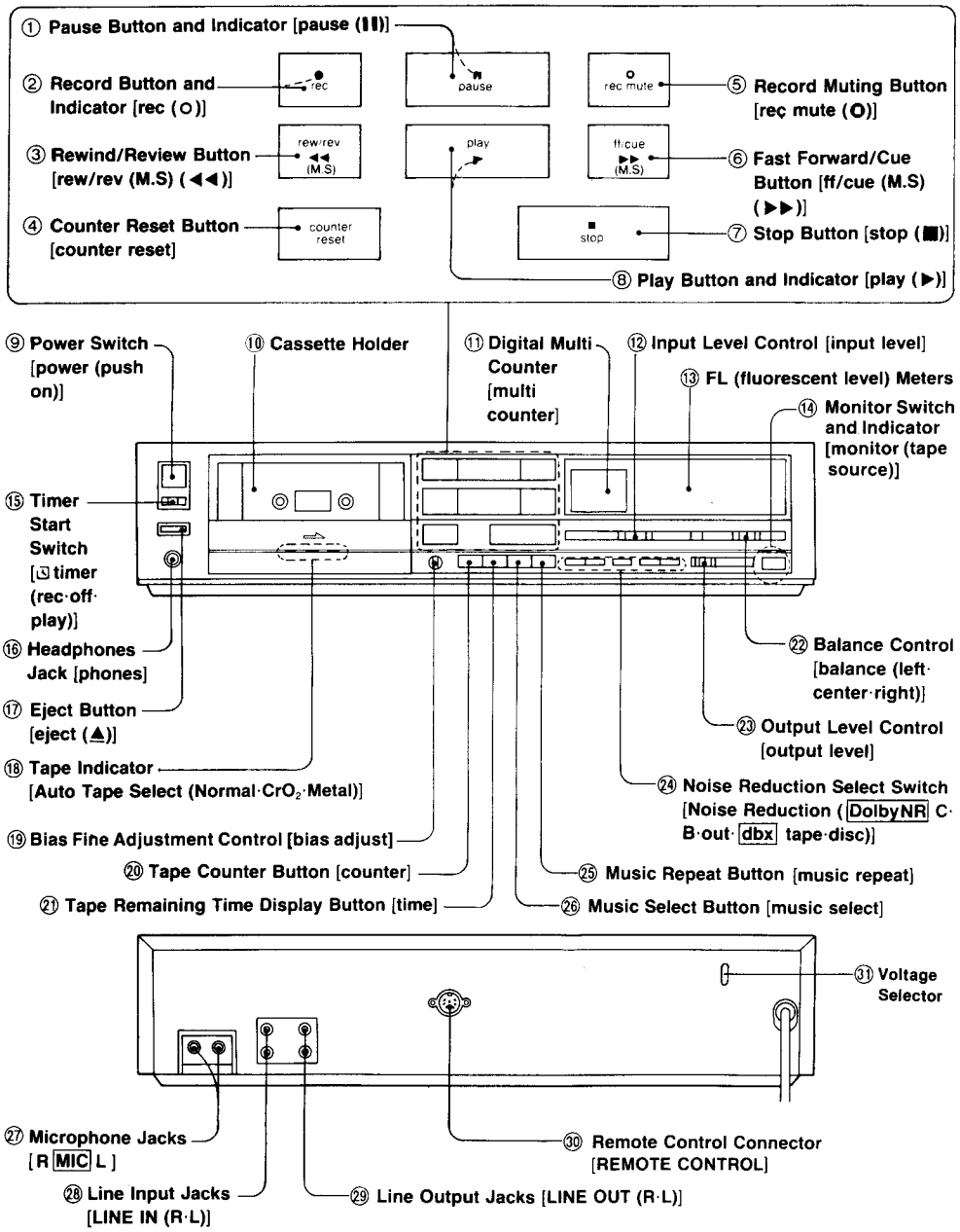
Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

CONTENTS

ITEM	PAGE
• Location of Controls and Components	2
• Disassembly Instructions	3
• Disassembly Notes	4
• Operating Precautions	4
• Measurement and Adjustment Methods	5
• Microcomputer Terminal Functions and Waveforms	11
• Block Diagram	12
• Schematic Diagram (for Main/Power Supply/ Muting Control Circuit Section)	15
• Schematic Diagram (for NR Circuit Section)	18
• Circuit Boards (for Main/ Power Supply Circuit Boards)	21
• Electrical Parts List	23
• Schematic Diagram (for Mechanism Control/ FL Meter Circuit Section)	25
• Circuit Boards (for FL Meter/ Muting Control/Mechanism Control/ Key Board Circuit Boards)	29
• Wiring Connection Diagram	32
• Mechanical Parts Location (included Parts List)	35
• Cabinet Parts Location (included Cabinet, Accessories and Packing Parts List)	37

LOCATION OF CONTROLS AND COMPONENTS


① Pause Button and Indicator [pause (❚❚)]
② Record Button and Indicator [rec (○)]
③ Rewind/Review Button [rew/rev (M.S) (◀◀)]
④ Counter Reset Button [counter reset]
⑤ Record Muting Button [rec mute (O)]
⑥ Fast Forward/Cue Button [ff/cue (M.S) (▶▶)]
⑦ Stop Button [stop (■)]
⑧ Play Button and Indicator [play (▶)]
rec
pause
rec mute
rew/rev (M.S)
play
ff/cue (M.S)
counter reset
stop
⑨ Power Switch [power (push on)]
⑩ Cassette Holder
⑪ Digital Multi Counter [multi counter]
⑫ Input Level Control [input level]
⑬ FL (fluorescent level) Meters
⑭ Monitor Switch and Indicator [monitor (tape source)]
⑮ Timer Start Switch [timer (rec·off·play)]
⑯ Headphones Jack [phones]
⑰ Eject Button [eject (▲)]
⑱ Tape Indicator [Auto Tape Select (Normal·CrO_2·Metal)]
⑲ Bias Fine Adjustment Control [bias adjust]
⑳ Tape Counter Button [counter]
㉑ Tape Remaining Time Display Button [time]
㉒ Balance Control [balance (left·center·right)]
㉓ Output Level Control [output level]
㉔ Noise Reduction Select Switch [Noise Reduction (DolbyNR C·B·out·dbx tape·disc)]
㉕ Music Repeat Button [music repeat]
㉖ Music Select Button [music select]
㉗ Microphone Jacks [R MIC L]
㉘ Line Input Jacks [LINE IN (R·L)]
㉙ Line Output Jacks [LINE OUT (R·L)]
㉚ Remote Control Connector [REMOTE CONTROL]
㉛ Voltage Selector

DISASSEMBLY INSTRUCTIONS

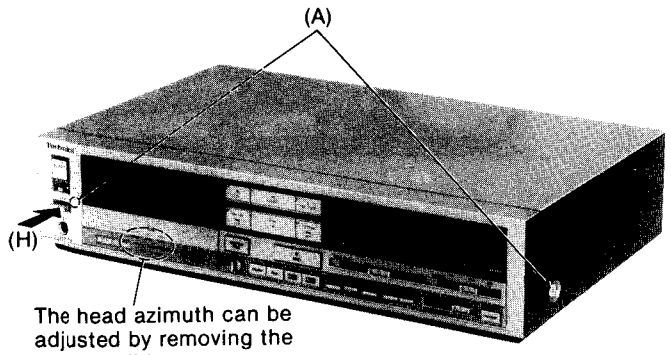


Fig. 1

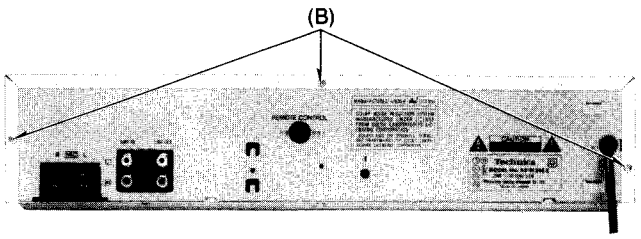


Fig. 2

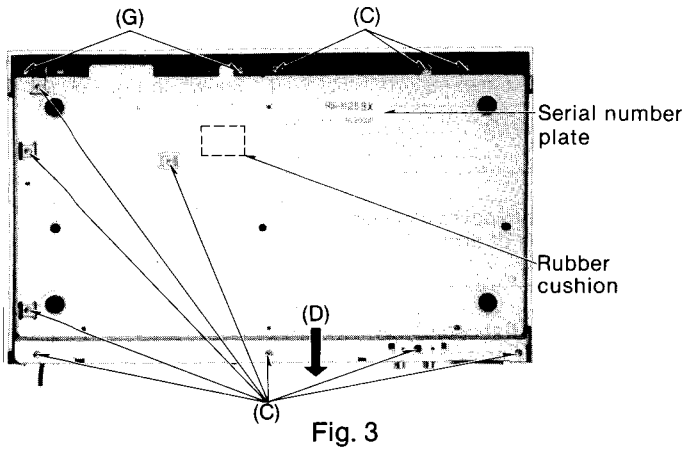
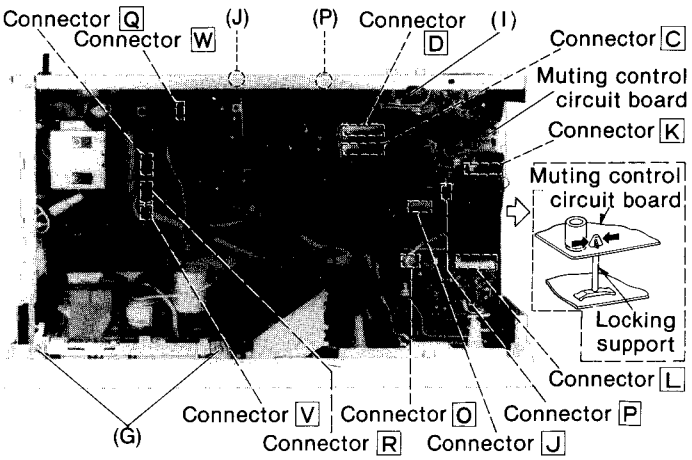


Fig. 3

NOTE:
When removing the bottom cover, do not allow the rubber cushion on the bottom cover to be trapped by the terminals of the electric components.



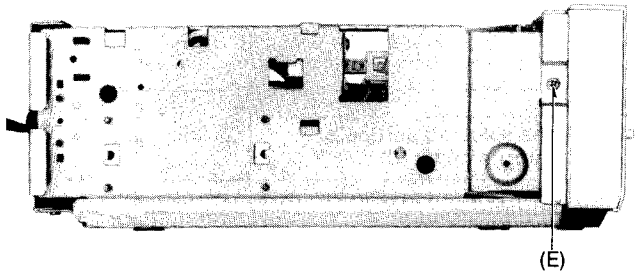
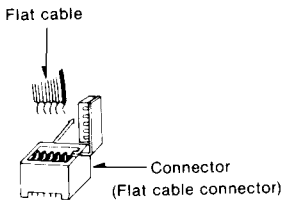


Fig. 5

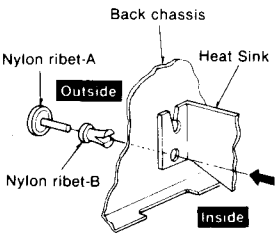
Fig. 6

(F) How to remove flat cable



Open the lid of connector in the direction of the arrow as shown left, and extract the flat cable to disconnect.

(J) (P) How to remove nylon rivet



To remove a heat sink from the back chassis, first press nylon rivet-A from the inside in the direction indicated by the arrow as shown left, and extract the rivet to the outside. Next remove nylon rivet-B from the outside. Consequently, the heat sink can be removed from the back chassis.

Fig. 4

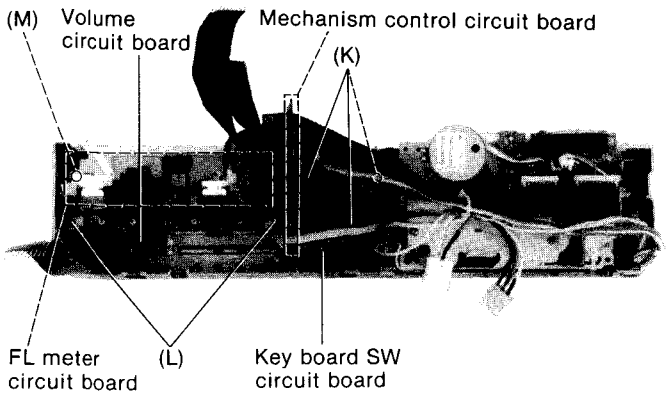


Fig. 7

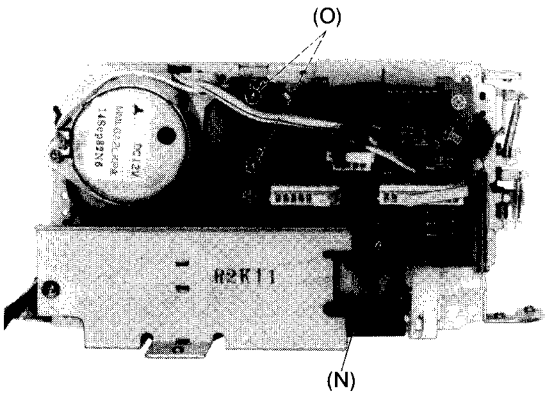


Fig. 8

Ref. No.	Procedure	To remove —.	Remove —.	Shown in fig. —.
1	1	Case cover	• 2 ornament screws .....(A) • 3 screws .....(B)	1 2
2	2	Bottom cover assembly	• 11 screws .....(C) • Slide the bottom cover assembly in the direction of arrow (D) and remove it.	3
3	1 → 2 → 3	Front panel assembly and Mechanism unit	• 2 screws .....(E) • How to remove flat cable .....(F)	5, 6 4
4	1 → 2 → 3 → 4	Mechanism unit	• 4 screws .....(G) • Push the EJECT button to open the cassette holder.....(H)	3, 4 1
5	1 → 2 → 3 → 5	Main circuit board	• 1 screw .....(I) • How to remove nylon rivet .....(J)	4 4
6	1 → 2 → 3 → 6	Key board SW and Mechanism control circuit board	• 3 screws .....(K)	7
7	1 → 2 → 3 → 7	Volume circuit board	• 2 screws .....(L)	7
8	1 → 2 → 3 → 8	FL Meter and FL Meter circuit board	• 1 screw .....(M)	7
9	1 → 2 → 3 → 9	Mechanism circuit board	• 1 screw .....(N) • Unsolder the soldered portion of the reel motor terminal (O)	8 8
10	1 → 10	Muting control circuit board	• 1 screw .....(I) • How to remove nylon rivet .....(P) • Remove the locking support from the board while pushing its tip in the direction of arrow.	4 4 4

* Serial No. Indication.

The serial number plate of this product is attached to the bottom cover (shown in Fig. 3).

DISASSEMBLY NOTES

When the bottom cover is removed for repair, measurement, or adjustment, the grounds of the mechanism chassis, back chassis, and side panel must be disconnected.
Otherwise, the auto tape selector will not operate normally and noise will be generated. To prevent these problems, use a cord to connect the mechanism chassis and the ground of the main circuit board.

OPERATING PRECAUTIONS

When the recorder is turned off during playback or music selection, the head base plate will not return. This prevents the cassette holder from opening. To open the cassette holder, turn on the recorder again (the head base plate will return) and press the EJECT button.

MEASUREMENT AND ADJUSTMENT METHODS

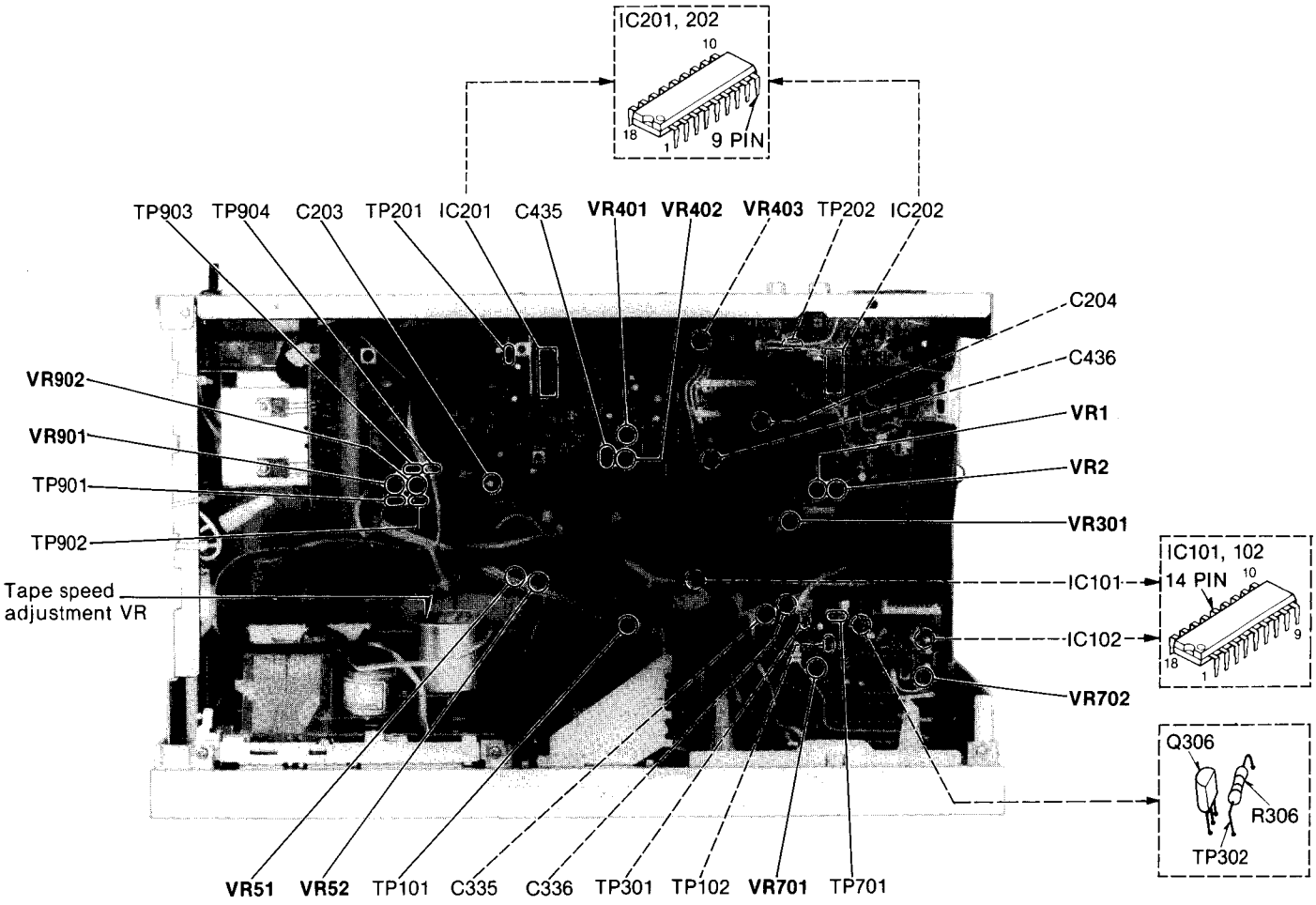


Fig. 1

NOTES: Set switches and controls in the following positions, unless otherwise specified.

- Make sure heads are clean
- Make sure capstan and pressure roller are clean
- Judgeable room temperature 20±5°C (68±9°F)
- Monitor selector: Tape
- Input level controls: Maximum
- Output level control: Maximum
- Dolby NR selector: OUT
- Bias fine adjust: Center
- Balance control: Center

Ⓐ Erase head height adjustment

Condition:
- Playback mode

Equipment:
- Test tape (tape path viewer) ...QZZCRD

Caution:

1. Remove screws (A) and (B) to replace the erase head. (Do not remove nut (C) since it is provided for erase head height, adjustment).
2. After erase head replacement, check by playing test tape (QZZCRD) to see that the tape travels properly.
3. For any tape travel performance problem, follow the procedure below for adjustment.

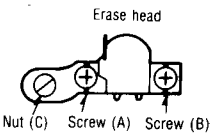


Fig. 2

Adjustment

1. Adjust nut (C) shown in fig. 2 so that the tape may not get curled or malformed by tape guide of the erase head.

Head Height Adjustment using the Head Adjustment Jig (QZZ0207)

The head adjustment jig (QZZ0207) enables accurate, speedy head height adjustment in the following manner.

a. Install the plate on the mechanism.
b. Set the mechanism in the PLAY mode.
c. Place the check bar on the plate.
d. Pass the check bar through the tape guides.
e. Adjust the nut (C) to prevent the check bar from contacting the tape guides.
f. Operate the tape path viewer (QZZCRD) to make sure that the tape is not in contact with the tape guide (i.e. the tape is not twisted).

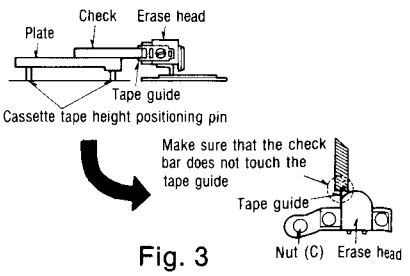


Fig. 3

Ⓑ Record/playback head adjustment

Condition:
- Playback mode
- Normal tape mode
- Output level control...MAX

Equipment:
- VTVM
- Oscilloscope
- Test tape (azimuth)...QZZCFM

L-CH/R-CH output balance adjustment

1. Make connections as shown in fig. 4.

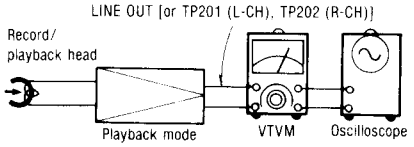


Fig. 4

2. Playback the 8kHz signal from the test tape (QZZCFM). Adjust screw (D) in fig. 5 for maximum output L-CH and R-CH levels. When the output levels of L-CH and R-CH are not at maximum at the same point adjust as follows.
3. Turn screw (D) shown in fig. 5 to find angles A and C (points where peak output levels for left and right channels are obtained). Then, locate angle B between angles A and C, i.e., point where L-CH and R-CH outputs are balanced. (Refer to figs. 5 and 6.)

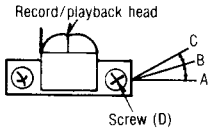


Fig. 5

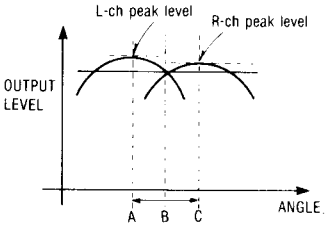


Fig. 6

L-CH/R-CH phase adjustment

4. Make connections as shown in fig. 7.
5. Playback the 8kHz signal from the test tape (QZZCFM). Adjust screw (D) shown in fig. 5 so that pointers of the two VTVMs swing to maximum and a lissajous waveform as illustrated in fig. 8 is obtained on the oscilloscope.

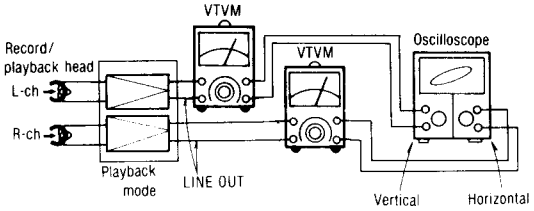


Fig. 7

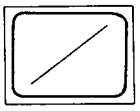


Fig. 8

Ⓒ Tape speed

Condition:
- Playback mode
- Output level control...MAX

Equipment:
- Digital frequency counter
- Test tape...QZZCWAT

Tape speed accuracy

1. Test equipment connection is shown in fig. 9.
2. Playback test tape (QZZCWAT 3,000Hz), and supply playback signal to the digital frequency counter.
3. Measure this frequency.
4. On the basis of 3,000Hz, determine value by following formula:

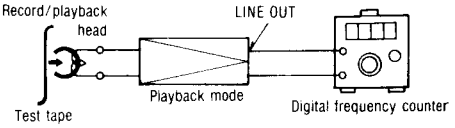


Fig. 9

$$\text{Tape speed accuracy} = \frac{f-3{,}000}{3{,}000} \times 100(\%) \qquad \text{where, } f = \text{measured value}$$

5. Take measurement at middle section of tape.

Standard value: ±1.5%

6. If measured value is not within the standard value, adjust it by using the tape speed adjustment VR shown in Fig. 1.
Note: Please use non metal type screwdriver when you adjust tape speed accuracy on this unit.

Tape speed fluctuation

Make measurements in same manner as above (beginning, middle and end of tape), and determine the difference between maximum and minimum values and calculate as follows:

$$\text{Tape speed fluctuation} = \frac{f_1-f_2}{3{,}000} \times 100(\%) \qquad f_1 = \text{maximum value}, \ f_2 = \text{minimum value}$$

Standard value: Less than 1%

Ⓓ Playback frequency response

Condition:
- Playback mode
- Normal tape mode
- Output level control...MAX

Equipment:
- VTVM
- Oscilloscope
- Test tape...QZZCFM

1. Test equipment connection is shown in fig. 4.
2. Playback the frequency response portion of test tape (QZZCFM).
3. Measure output level at 315Hz, 12.5kHz, 8kHz, 4kHz, 1kHz, 250Hz, 125Hz and 63Hz, and compare each output level with the standard frequency 315Hz, at test point [TP201 (L-CH), TP202 (R-CH)].
4. Make measurements for both channels.
5. Make sure that the measured values are within the range specified in the frequency response chart. (Shown in fig. 10).

Playback frequency response chart

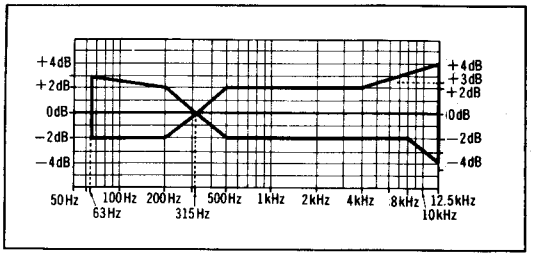


Fig. 10

Ⓔ Playback gain

Condition:
- Playback mode
- Normal tape mode
- Output level control...MAX

Equipment:
- VTVM
- Oscilloscope
- Test tape...QZZCFM

1. Test equipment connection is shown in fig. 4.
2. Playback standard recording level portion on test tape (QZZCFM 315Hz) and, using VTVM, measure the output level at test points [TP201 (L-CH), TP202 (R-CH)].
3. Make measurements for both channels.

Standard value: 0.28V [0.4±0.05V: at LINE OUT jack]

Adjustment
1. If the measured value is not within the standard, adjust VR1 (L-CH) or VR2 (R-CH) (See fig 1).
2. After adjustment, check "Playback frequency response" again.

Ⓕ Erase current

Condition:
- Record mode
- Metal tape mode
- Bias fine adjustment VR ...Center

Equipment:
- VTVM
- Oscilloscope

1. Test equipment connection is shown in fig. 11.
2. Place UNIT into metal tape mode.
3. Press the record and pause buttons.
4. Read voltage on VTVM and calculate erase current by following formula:

$$\text{Erase current (A)} = \frac{\text{Voltage across resistor R903}}{1\,(\Omega)}$$

Standard value: 95^{+10}_{-15}mA (Metal)

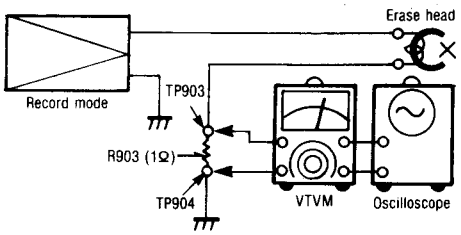


Fig. 11

5. If the measured value is not within the standard value adjust it by following the adjustment instructions.

Adjustment
1. Short points (A) and (B) on the main circuit board. Refer to the circuit board diagram on page 22.
2. Measure the erase current.
3. If the erase current is less than 80mA, open the point (B).
4. If the erase current is more than 105mA, open the points (A).

G Overall frequency response

Condition:
- Record/playback mode
- Normal tape mode
- CrO_2 tape mode
- Metal tape mode
- Input level controls...MAX
- Output level control...MAX
- Bias fine adjustment VR ...Center
- Balance control...Center

Equipment:
- VTVM
- ATT
- AF oscillator
- Oscilloscope
- Resistor (600Ω)
- Test tape (reference blank tape)
  ...QZZCRA for Normal
  ...QZZCRX for CrO_2
  ...QZZCRZ for Metal

Note:

Before measuring and adjusting, the overall frequency response make sure of the playback frequency response (For the method of measurement, please refer to the playback frequency response).

(Recording equalizer is fixed)

1. Make connections as shown in fig. 13.
2. Place UNIT into normal tape mode and insert the normal reference blank test tape (QZZCRA).
3. Supply a 1kHz signal from the AF oscillator through ATT to LINE IN.
4. Adjust ATT so that input level is −20dB below standard recording level (standard recording level = 0 VU).
5. Adjust the AF oscillator frequency to 1kHz, 50Hz, 100Hz, 200Hz, 500Hz, 4kHz, 8kHz, 10kHz, 12.5kHz and 14kHz signals, and record these signals on the test tape.
6. Playback the signals recorded in step 6, and check if the frequency response curve is within the limits shown in the overall frequency response chart for normal tapes (fig. 12).
   (If the curve is within the charted specifications, proceed to steps 7, 8 and 9.).
   If the curve is not within the charted specifications, adjust as follows;

Overall frequency response chart (Normal)

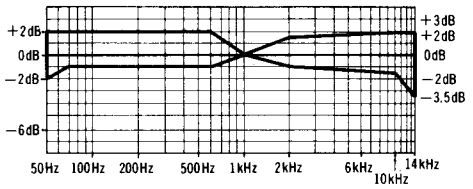


Fig. 12

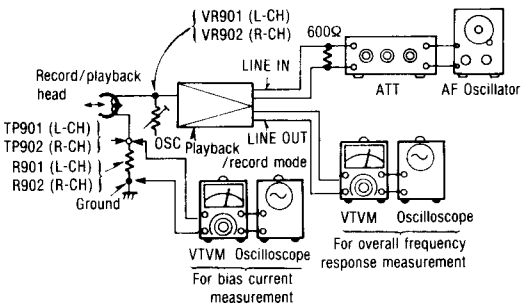


Fig. 13

Adjustment (A):

When the curve exceeds the overall specified frequency response chart (fig. 12) as shown in fig. 14.

1) Increase bias current by turning VR901 (L-CH) and VR902 (R-CH).
   (See fig. 1 on page 5.)
2) Repeat steps 5 and 6 for confirmation (Proceed to steps 7, 8 and 9 if the curve is now within the charted specifications as shown fig. 12).
3) If the curve still exceeds the specifications (fig. 12), increase bias current further and repeat steps 5 and 6.

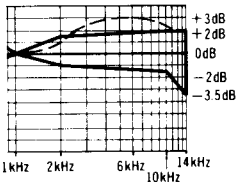


Fig. 14

Adjustment (B):

When the curve falls below the overall specified frequency response chart (fig. 12) as shown in fig. 15.

1) Reduce bias current by turning VR901 (L-CH) and VR902 (R-CH).
2) Repeat steps 5 and 6 for confirmation (Proceed to steps 7, 8 and 9 if the curve is now within the charted specifications as shown fig. 12).
3) If the curve still falls below the charted specifications (fig. 12), reduce bias current further and repeat steps 5 and 6.

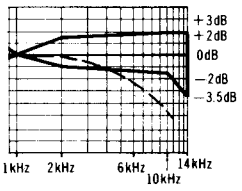


Fig. 15

7. Place UNIT into CrO_2 tape mode.
8. Change test tape to CrO_2 reference blank test tape (QZZCRX), and record 1kHz, 50Hz, 100Hz, 200Hz, 500Hz, 4kHz, 8kHz, 10kHz, 12.5kHz, 14kHz and 16kHz signals. Then, playback the signals and check if the curve is within the limits shown in the overall frequency response chart for CrO_2 tapes (fig. 16).
9. Place UNIT into metal tape mode and change test tape to metal reference blank test tape (QZZCRZ), and record 1kHz, 50Hz, 100Hz, 200Hz, 500Hz, 4kHz, 8kHz, 10kHz, 12.5kHz, 14kHz and 16kHz signals. Then, playback the signals and check if the curve is within the limits shown in the overall frequency response chart for metal tapes (fig. 16).
10. Confirm that bias currents are approximately as follows when the UNIT is set at different tape mode.
    - Read voltage on VTVM between ground and test point (TP901 for L-CH, TP902 for R-CH) and calculate bias current by following formula:

$$\text{Bias current (A)} = \frac{\text{Value read on VTVM (V)}}{10\ (\Omega)}$$

Overall frequency response chart (CrO_2, Metal)

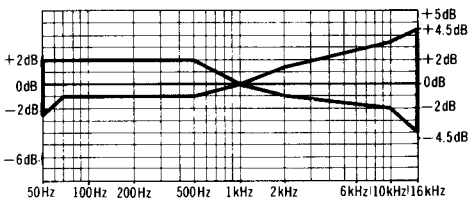


Fig. 16

	around 500μA (Normal position)
Standard value:	**around 710μA (CrO_2 position)**
	around 1200μA (Metal position)

Ⓗ Overall gain

Condition:
- Record/playback mode
- Normal tape mode
- Input level controls...MAX
- Output level control...MAX
- Bias fine adjustment VR ...Center
- Standard input level;
  MIC .....−72±3dB
  LINE IN .....−24±3dB

Equipment:
- VTVM
- AF oscillator
- ATT
- Oscilloscope
- Resistor (600Ω)
- Test tape (reference blank tape) ...QZZCRA for Normal

1. Test equipment connection is shown in fig. 17.
2. Insert the normal reference blank tape (QZZCRA).
3. Place UNIT into record mode.
4. Supply a 1kHz signal through ATT (−24dB) from AF oscillator, to LINE IN.
5. Adjust ATT until monitor level at test points [TP201 (L-CH), TP202 (R-CH)] becomes 0.28V [0.4V±1dB at test LINE OUT jack].
6. Playback recorded tape, and make sure that the output level at test points [TP101 (L-CH), TP102 (R-CH)] becomes 0.28V [0.4V±1dB at test LINE OUT jack].
7. If measured value is not 0.28V, adjust it by using VR51 (L-CH) or VR52 (R-CH).
8. Repeat from step (2).

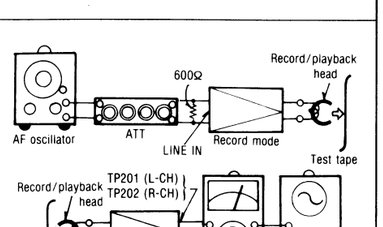


Fig. 17

Ⓘ Fluorescent meter

Condition:
- Record mode
- Input level controls...MAX
- Output level control...MAX

Equipment:
- VTVM
- ATT
- AF oscillator

• Check for FL meter

To check the accuracy of the FL meter, measure the output level at test point [TP101 (L-CH), TP102 (R-CH)].

1. Make connections as shown (See fig. 18).
2. Connect a wire between TP701 and ground terminal (See fig. 19).
3. In the recording pause mode, apply 1kHz (−24dB) to LINE IN.
4. Adjust ATT so that output level at test point [TP101 (L-CH), TP102 (R-CH)] is 0.28V.

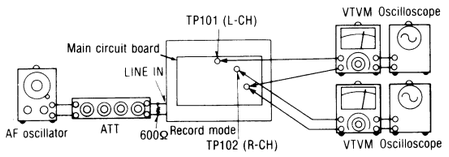


Fig. 18

Checking FL meter 0dB segment display ON/OFF

Change the output level at test point [TP101 (L-CH), TP102 (R-CH)] from 0.28V −1dB (≒250mV) to 0.28V +1dB (≒310mV) by adjusting the attenuator, and check that the FL meter 0dB segment display OFF state changes to the ON state.

Checking FL meter −40dB segment display ON/OFF

Lower the signal level 28dB below the standard input level (−24dB−28dB = −52dB≒2.5mV) and then further lower the level 12dB (−52dB−12dB = −64dB≒0.63mV) by adjusting the attenuator. While lowering the level as described above, make sure that only the −40dB display remains lit the dims or goes off at the lowest level.

• Adjustment for FL meter

1. Make connections as shown (See fig. 18).
2. Connect a wire between TP701 and ground terminal (See fig. 19).
3. In the recording pause mode, apply 1kHz (−24dB) to LINE IN.
4. Adjust ATT so that output level at test point [TP101 (L-CH), TP102 (R-CH)] is 0.28V.

−40dB adjustment

5. Adjust ATT so that the level adjusted at step 4 is reuced by 40dB.
6. At this time, check that −40dB indicator is dimmed (intermediate brightness between full brightness and light-out: See fig. 20).
7. If the indicator is not lighted halfway as described in step 6, adjust VR702.

0dB adjustment

8. Restore the condition of step 4 (set output level to 0.28V at test point [TP101 (L-CH), TP102 (R-CH)].
9. At this time, check that 0dB indicator is dimmed (intermediate brightness between full brightness and light-out (See fig. 21).
10. If improper, adjust VR701.
11. Repeat adjustments at steps 4, 5, 6, 7, 8, 9 and 10 two or three times.
12. Disconnect the wire between TP701 and ground terminal, which had been connected at step 2.

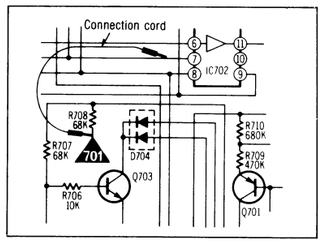


Fig. 19

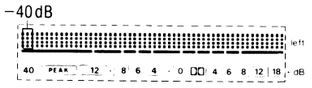


Fig. 20

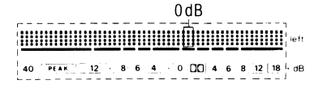


Fig. 21

Ⓙ Dolby NR circuit

Condition:
- Record mode/playback mode
- Dolby NR switch...IN/OUT
- Dolby NR select switch...B/C
- Input level controls...MAX
- Output level controls...MAX

Equipment:
- VTVM
- AF oscillator
- ATT
- Oscilloscope
- Resistor (600Ω)
- Balance control...Center

Record side

- Check of the Dolby-B type encoder characteristics
1. Make connections as shown in fig. 22.
2. Set the unit to the record mode. (NR select switch is OUT.)
3. Apply a 1kHz signal to LINE IN.
4. Adjust the ATT so that the output level at TP101 (L-CH) and TP102 (R-CH) is 12.3mV.
5. The output level at pin 9 should be 0dB.
6. Set the NR select switch to B, and make sure that the output signal level at pin 9 of IC101 (L-CH) and IC102 (R-CH) is +6dB±1.5dB.
7. Set the NR select switch to OUT, and adjust the frequency to 5kHz. The output signal level at pin 9 should be 0dB.
8. Set the NR select switch to B and make sure that the output signal level at pin 9 of IC101 (L-CH) and IC102 (R-CH) is +8dB±1.5dB.

- Check to Dolby-C type encoder characteristics
9. Repeat steps 1-5 above.
10. Set the NR select switch to C and make sure that the output signal level at pin 9 of IC101 (L-CH) and IC102 (R-CH) is +11.4dB±1dB.
11. Set the NR select switch to OUT and adjust the frequency to 5kHz. The output signal at pin 9 should be 0dB.
12. Set the NR select switch to C and make sure that the output signal level at pin 9 of IC101 (L-CH) and IC102 (R-CH) is +8.4dB±1.5dB.

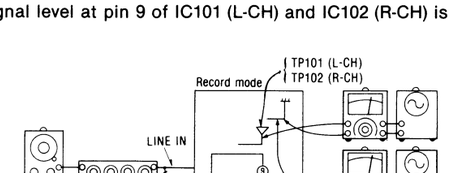


Fig. 22

Playback side

- Check of the Dolby-B type decoder characteristics
1. Make connections as shown in fig. 23.
2. Set the unit to the playback mode. (NR select switch is OUT.)
3. Apply a 1kHz signal to the minus terminals of the C203 (L-CH) and C204 (R-CH).
4. Adjust the ATT so that the output level at pin 14 of IC201 (L-CH) and IC202 (R-CH) is 12.3mV.
5. The output level at TP201 (L-CH) and TP202 (R-CH) should be 0dB.
6. Set the NR select switch to B, and make sure that the output signal level at TP201 (L-CH) and TP202 (R-CH) is −6dB±2.5dB.
7. Set the NR select switch to OUT, and adjust the frequency to 5kHz. The output signal level at TP201 (L-CH) and TP202 (R-CH) should be 0dB.
8. Set the NR select switch to B and make sure that the output signal level at TP201 (L-CH) and TP202 (R-CH) is −10dB±2.5dB.

- Check to Dolby-C type decoder characteristics
9. Repeat steps 1-5 above.
10. Set the NR select switch to C and make sure that the output signal level at TP201 (L-CH) and TP202 (R-CH) is −19dB±2.5dB.
11. Set the NR select switch to OUT and adjust the frequency to 5kHz. The output signal at TP201 (L-CH) and TP202 (R-CH) should be 0dB.
12. Set the NR select switch to C and make sure that the output signal level at TP201 (L-CH) and TP202 (R-CH) is −16dB±2.5dB.

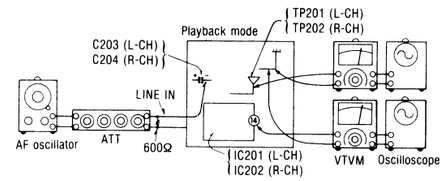


Fig. 23

Ⓚ Attack recovery time adjustment (dbx circuit)

Condition:
- Record mode
- Input level control...MAX
- Noise reduction selector ...dbx tape/dbx disc
- Balance control...Center
- Output level control...MAX
- Bias fine adjustment VR ...Center

Equipment:
- VTVM
- ATT
- AF oscillator
- DC voltmeter

Record side

1. Make the connections as shown in fig. 24 and apply 1kHz −27dB signal from LINE IN, and set the noise reduction selector to dbx tape position.
2. Set the unit to record mode, adjust ATT so that the signal level at C335 (L-CH) and C336 (R-CH) is 300mV.
3. Read voltage on DC volt meter.

Reference value: 15±0.5mV

4. If measured value is not within reference, adjust VR301 (shown in Fig. 1).

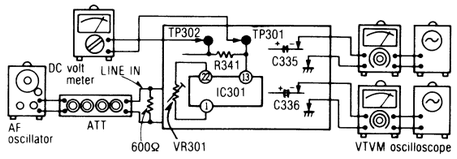
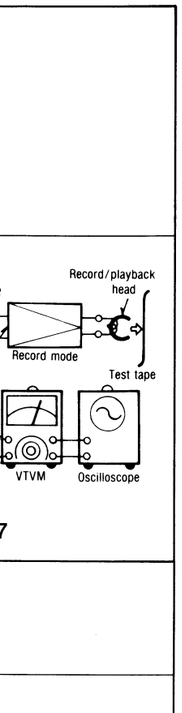


Fig. 24



Ⓙ Dolby NR circuit

Condition:
- Record mode/playback mode
- Dolby NR switch...IN/OUT
- Dolby NR select switch...B/C
- Input level controls...MAX
- Output level controls...MAX

Equipment:
- VTVM
- AF oscillator
- ATT
- Oscilloscope
- Resistor (600Ω)
- Balance control...Center

Record side

- Check of the Dolby-B type encoder characteristics
1. Make connections as shown in fig. 22.
2. Set the unit to the record mode. (NR select switch is OUT.)
3. Apply a 1kHz signal to LINE IN.
4. Adjust the ATT so that the output level at TP101 (L-CH) and TP102 (R-CH) is 12.3mV.
5. The output level at pin 9 should be 0dB.
6. Set the NR select switch to B, and make sure that the output signal level at pin 9 of IC101 (L-CH) and IC102 (R-CH) is +6dB±1.5dB.
7. Set the NR select switch to OUT, and adjust the frequency to 5kHz. The output signal level at pin 9 should be 0dB.
8. Set the NR select switch to B and make sure that the output signal level at pin 9 of IC101 (L-CH) and IC102 (R-CH) is +8dB±1.5dB.

- Check to Dolby-C type encoder characteristics
9. Repeat steps 1-5 above.
10. Set the NR select switch to C and make sure that the output signal level at pin 9 of IC101 (L-CH) and IC102 (R-CH) is +11.4dB±1dB.
11. Set the NR select switch to OUT and adjust the frequency to 5kHz. The output signal at pin 9 should be 0dB.
12. Set the NR select switch to C and make sure that the output signal level at pin 9 of IC101 (L-CH) and IC102 (R-CH) is +8.4dB±1.5dB.

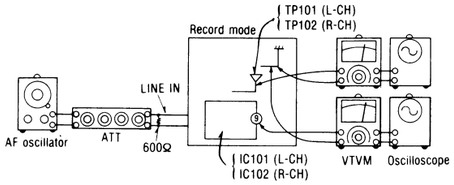


Fig. 22

Playback side

- Check of the Dolby-B type decoder characteristics
1. Make connections as shown in fig. 23.
2. Set the unit to the playback mode. (NR select switch is OUT.)
3. Apply a 1kHz signal to the minus terminals of the C203 (L-CH) and C204 (R-CH).
4. Adjust the ATT so that the output level at pin 14 of IC201 (L-CH) and IC202 (R-CH) is 12.3mV.
5. The output level at TP201 (L-CH) and TP202 (R-CH) should be 0dB.
6. Set the NR select switch to B, and make sure that the output signal level at TP201 (L-CH) and TP202 (R-CH) is −6dB±2.5dB.
7. Set the NR select switch to OUT, and adjust the frequency to 5kHz. The output signal level at TP201 (L-CH) and TP202 (R-CH) should be 0dB.
8. Set the NR select switch to B and make sure that the output signal level at TP201 (L-CH) and TP202 (R-CH) is −10dB±2.5dB.

- Check to Dolby-C type decoder characteristics
9. Repeat steps 1-5 above.
10. Set the NR select switch to C and make sure that the output signal level at TP201 (L-CH) and TP202 (R-CH) is −19dB±2.5dB.
11. Set the NR select switch to OUT and adjust the frequency to 5kHz. The output signal at TP201 (L-CH) and TP202 (R-CH) should be 0dB.
12. Set the NR select switch to C and make sure that the output signal level at TP201 (L-CH) and TP202 (R-CH) is −16dB±2.5dB.

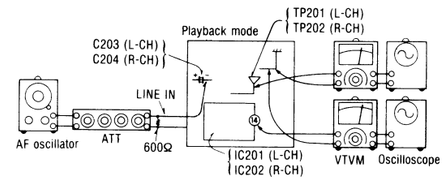


Fig. 23

Ⓚ Attack recovery time adjustment (dbx circuit)

Condition:
- Record mode
- Input level control...MAX
- Noise reduction selector ...dbx tape/dbx disc
- Balance control...Center
- Output level control...MAX
- Bias fine adjustment VR ...Center

Equipment:
- VTVM
- ATT
- AF oscillator
- DC voltmeter

Record side

1. Make the connections as shown in fig. 24 and apply 1kHz −27dB signal from LINE IN, and set the noise reduction selector to dbx tape position.
2. Set the unit to record mode, adjust ATT so that the signal level at C335 (L-CH) and C336 (R-CH) is 300mV.
3. Read voltage on DC volt meter.

Reference value: 15±0.5mV

4. If measured value is not within reference, adjust VR301 (shown in Fig. 1).

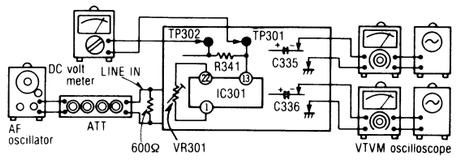


Fig. 24

Playback side

1. Make the connections as shown in fig. 25 and apply 1kHz −27dB signal from LINE IN, and set the noise reduction selector to dbx disc position.
2. Set the unit to record mode, adjust ATT so that the signal level at C435 (L-CH) and C436 (R-CH) is 300mV.
3. Read voltage on DC volt meter.

Reference value: 15±0.5mV

4. If measured value is not within reference, adjust VR403 (shown in Fig. 1).

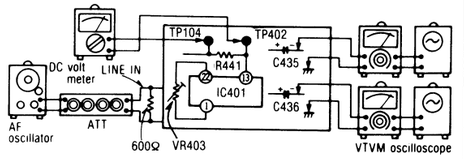


Fig. 25

Ⓛ Overall gain (dbx circuit)

Condition:
- Record/playback mode
- Normal tape mode
- Noise reduction selector ...dbx tape
- Input level controls...MAX
- Output level control...MAX
- Bias fine adjustment VR ...Center
- Standard input level;
  MIC .....−72±3dB
  LINE IN .....−24±3dB

Equipment:
- VTVM
- AF oscillator
- ATT
- Oscilloscope
- Resistor (600Ω)
- Test tape (reference blank tape) ...QZZCRA for Normal

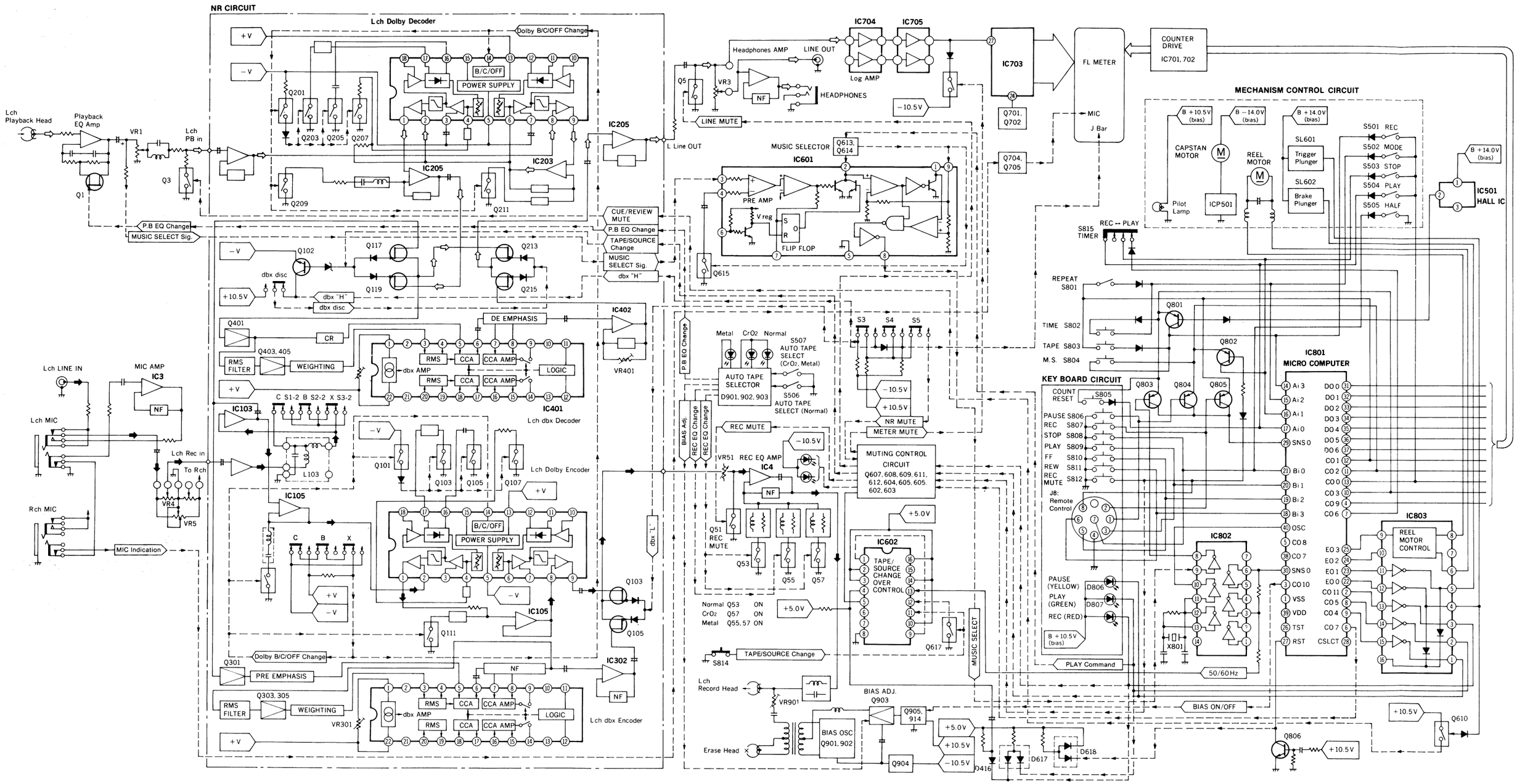
Note:

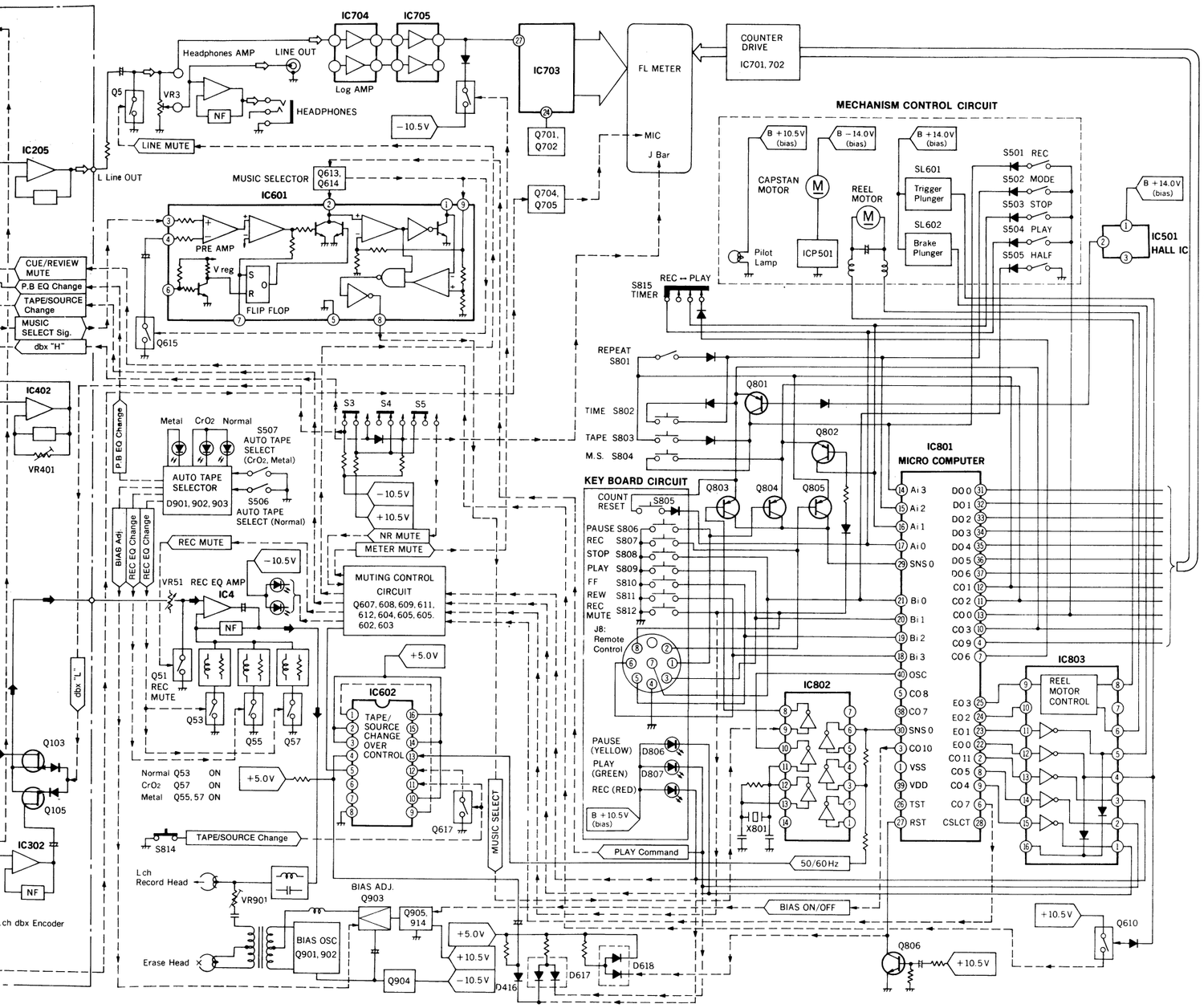
Before adjustment, make sure that the overall gain Ⓗ in the NR OUT mode complies within the specifications.
1. Test equipment connection is shown in fig. 17.
2. Insert the normal reference blank tape (QZZCRA).
3. Set the NR switch in the dbx tape mode and the monitor switch in the source mode.
4. Place UNIT into record mode.
5. Supply a 1kHz signal through ATT (−24dB) from AF oscillator, to LINE IN.
6. Adjust ATT until monitor level at test points [TP101 (L-CH), TP102 (R-CH)] becomes 0.28V [0.4V±1dB at test LINE OUT jack].
7. Set the monitor switch in the tape mode.
8. Playback recorded tape, and make sure that the output level at test points [TP201 (L-CH), TP202 (R-CH)] becomes 0.28V [0.4V±1dB at test LINE OUT jack].
9. If measured value is not 0.28V, adjust it by using VR401 (L-CH) or VR402 (R-CH).
10. Repeat from step (2).

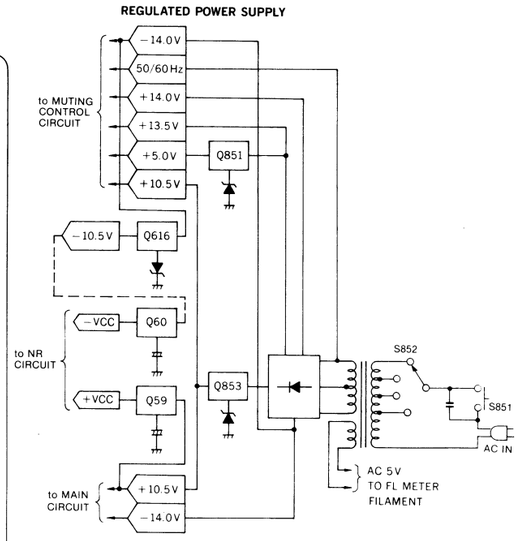
MICROCOMPUTER TERMINAL FUNCTIONS AND WAVEFORMS

The terminal functions and waveforms of the microcomputer (IC801; MN1405RMB) used in this product are identical to those of RS-M245X.
Refer to the RS-M245X Service Manual.

BLOCK DIAGRAM (L-CH ONLY)







NOTES:

- S1 : Dolby-C IN/OUT SWITCH (OUT)
- S2 : Dolby-B IN/OUT SWITCH (OUT)
- S3 : dbx TAPE IN/OUT SWITCH (OUT)
- S4 : dbx disc IN/OUT SWITCH (OUT)
- S5 : NR MUTE SWITCH
- S501: REC INHIBIT SWITCH
- S502: MODE SWITCH
- S503: STOP SWITCH
- S504: PLAY SWITCH
- S505: HALF SWITCH
- S506: AUTO TAPE SELECT SWITCH (Normal)
- S507: AUTO TAPE SELECT SWITCH (Metal, CrO_2)
- S801: MUSIC REPEAT SWITCH
- S802: TIME COUNTER SWITCH
- S803: TAPE COUNTER SWITCH
- S804: MUSIC SELECT COUNTER SWITCH
- S805: COUNTER RESET COUNTER SWITCH
- S806: PAUSE SWITCH
- S807: RECORD SWITCH
- S808: STOP SWITCH
- S809: PLAY SWITCH
- S810: FF SWITCH
- S811: REWIND SWITCH
- S812: REC MUTE SWITCH
- S813: TIMER SWITCH
- S814: MONITOR SWITCH
- S851: POWER ON/OFF SWITCH
- S852: AC POWER VOLTAGE SELECT SWITCH.
- (▬▶) this arrow indicates the flow of the recording signal. (NR OUT/TAPE MONITOR).
- (▭▶) this arrow indicates the flow of the playback signal. (NR OUT/TAPE MONITOR).
- (–►–) this arrow indicates the flow of the control signal.

NOTES:

- S1-1—S1-4 ...Dolby-C IN/OUT switch (shown in OUT position).
- S2-1—S2-4 ...Dolby-B IN/OUT switch (shown in OUT position).
- S3-1—S3-6 ...dbx tape IN/OUT switch (shown in OUT position).
- S4-1, S4-2 .....dbx disc IN/OUT switch (shown in OUT position).
- S5 .....NR muting switch (shown in OFF position).
- S814 .....Monitor tape/source select switch.
- S851 .....Power ON/OFF switch (shown in OFF position).
- S852 .....AC power voltage select switch (shown in 240V position).
- VR1, 2 .....Playback gain adjustment VR.
- VR3 .....Output level controls.
- VR4 .....Input level controls.
- VR5 .....Channel balance control.
- VR51, 52 .....Overall gain adjustment VR.
- VR301, 403 ...Attack recoverly time adjustment VR.
- VR401, 402 ...dbx overall gain adjustment VR.
- VR901, 902 ...Bias current adjustment VR.
- VR903 .....Bias fine adjustment control.
- Points (A), (B)...Erase current adjustment points.
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise. 1K = 1,000(Ω), 1M = 1,000k(Ω).
- Capacity are in micro-farads (μF) unless specified otherwise.
- The mark (▼) shows test point. e.g. ▼= Test point 1.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  - No mark .....Voltage values at OUT (NR select switch) mode.
  - ( ) .....Voltage values at record mode.
  - Tape.....Voltage values at tape monitor mode.
  - STOP .....Voltage values at stop mode.
  - NR/Dolby C ...Voltage values at Dolby-C mode.
  - NOR .....Voltage values at Normal tape mode.
  - Met .....Voltage values at Metal tape mode.

  For measurement use VTVM.
- (▬▶) indicates B+ (bias).
- (▬▶▬) indicates B− (bias).
- (▬▶▬) indicates the flow of the playback signal. (NR out).
- (▬▶) indicates the flow of the recording signal. (NR out).
- Important safety notice
  Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- Described in the schematic diagram are two types of numbers; the supply parts numbers and production parts number for transistors and diodes.
  One type of number is used for supply parts number and production parts number when they are identical.
  e.g. Q1
  2SC1844(E,F)◄—Production parts number
  [2SC1844E]◄—Supply parts number
  D212
  1S2473T77◄—Production parts number
  [MA161]◄—Supply parts numbers
- The supply parts number is described alone in the replacement parts list.

- **This schematic diagram may be modified at any time with the development of new technology.**

SCHEMATIC DIAGRAM (for Main/Power Supply/Muting Control Circuit Section)

SPECIFICATIONS

* Output level control...MAX
* Input level control ...MAX
* Balance control .....Center

Playback S/N ratio * Test tape...QZZCFM	Greater than 45dB
Overall distortion * Test tape ...QZZCRA for Normal ...QZZCRX for CrO_2 ...QZZCRZ for Metal	Less than 3%
Overall S/N ratio *Test tape...QZZCRA	Greater than 43dB (without NAB filter)

NOTES:

- D ..... For all European areas except United Kingdom.
- B ..... For United Kingdom.
- N ..... For Asia, Latin America, Middle East and Africa areas.
- A ..... For Australia.

I MAIN CIRCUIT SECTION (without NR CIRCUIT)

IC1,3 [M5220L] Q1,2 2SK381C [2SK381] Q3,4,55~58 [2SC2603] Q59 2SD638R [2SD638] Q5,6,51,52 2SD1330R [2SD1330] Q53,54 2SB641R [2SB641] IC2,4 [M5218L]

PLAYBACK EQ AMP

HEADPHONES AMP

P.B HEAD Lch

P.B HEAD Rch (QWY4148Y)

Lch N.R AMP (DECODER)

Rch N.R AMP (DECODER)

J3 LINE OUT Lch

J4 LINE OUT Rch

HEADPHONES

D904 [MA161]

MIC AMP

J1 LINE IN Lch

LINE IN -24~3dB

J5 MIC Lch

MIC 72±3dB

J2 LINE IN Rch

J6 MIC Rch

REC EQ AMP

Lch N.R AMP (ENCODER)

Rch N.R AMP (ENCODER)

BIAS OSC

Rec HEAD Lch

Rec HEAD Rch

E. HEAD (QWY2183Z)

Point (A)

Point (B)

MIC J. BAR } to FL METER CIRCUIT SECTION

LED501 (QVDLS003M) Normal CrO_2 Metal

M LINE MUTE, ATS (A), ATS (B), BOS, T/S, N.R SW, C/R, REC MUTE, M.S } to MUTING CIRCUIT CONTROL SECITON

VI POWER SUPPLY CIRCUIT SECTION

T +5V, +13.5V, 50/60Hz, GND, +10.5V, +14.0V, -14.0V, -10.5V, AC 5V, AC 5V } TO MUTING CONTROL CIRCUIT SECTION

S -14.0V, +14.0V, GND, GND, +10.5V, -10.5V

AC IN

Q60 2SB643R [2SB643] Q901,902 2SD1225RM [2SD1225] Q903 2SD946R [2SD946] *Q904 2SB793R [2SB793] D905 (MA1043M) Q905 2SB641R [2SB641] Q906 [DTC144A] Q853 [2SD1265OP] D854 MA1110M (MA1110) D853,855~859 [SM112] D851 [RVDRD6R8EB] Q851 [2SD1275]

III MUTING CONTROL CIRCUIT SECTION

D604,608 [MC921TA] D601 MA1082MTA (SVDRD8.2EB) [2SB

from MAIN CIRCUIT SECTION: LINE MUTE, ATS (A), ATS (B), BOS, T/S, N.R SW, C/R, REC MUTE, M.S

from MAIN CIRCUIT SECTION: GND, L (VR in), L (VR out), GND, GND, R (VR in), R (VR out)

from SLIDE VOLUME CIRCUIT SECTION: GND, T/S SW, L (VR in), L (VR out), GND, R (VR in), R (VR out), TAPE LED, SOURCE LED -10.5V

from FL METER SECTION: MUTE, GND, -14.0V, +10.5V, -10.5V, AC 5V, AC 5V, +14.0V, Rch, Lch

D1 [LN416YP] D2 [LN316GP] D602,603,605~607,609~611, 616,619 [MA161] D617, [MC91

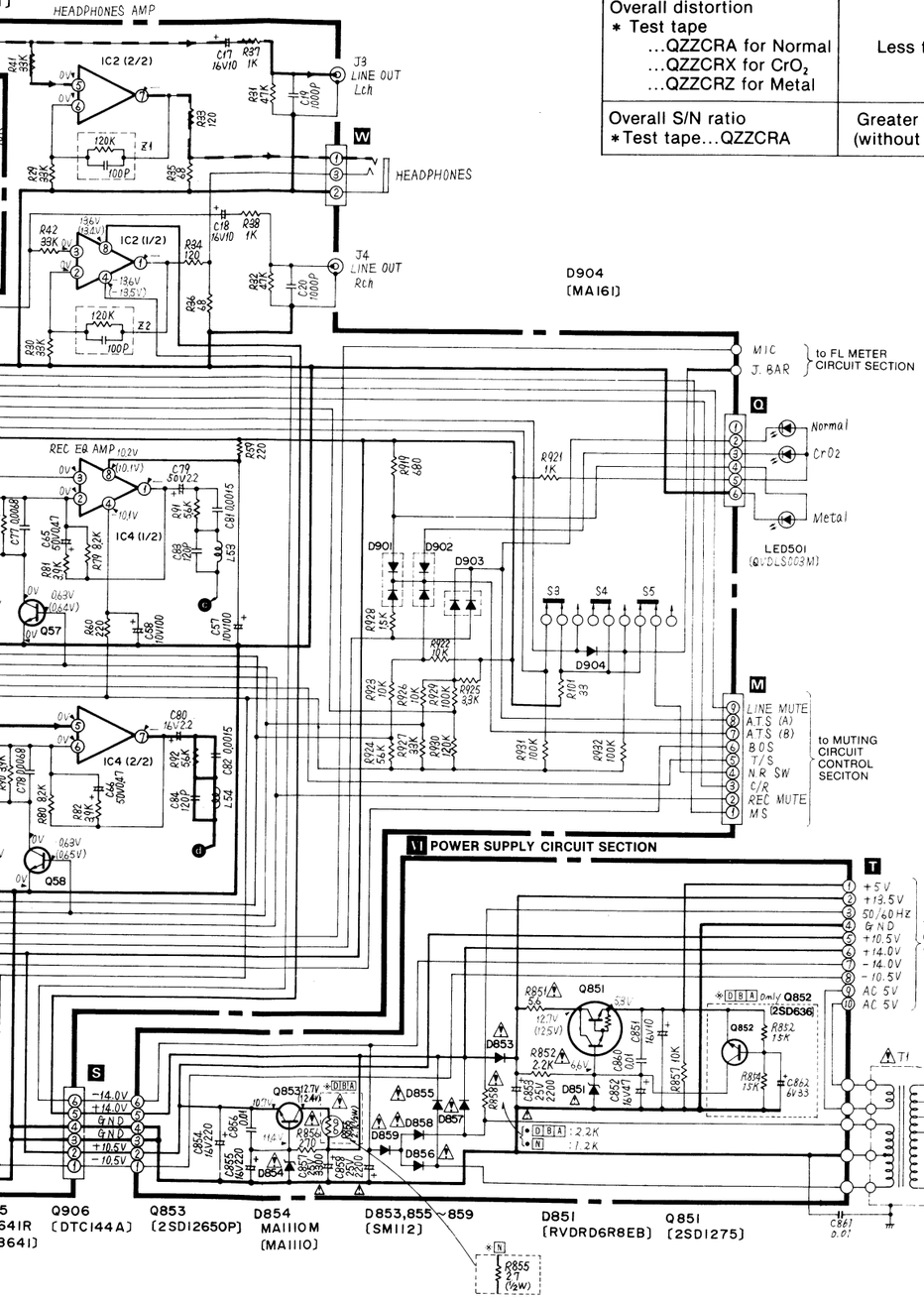
RS-M253X

ng Control Circuit Section)

* Output level control...MAX
* Input level control ...MAX
* Balance control .....Center

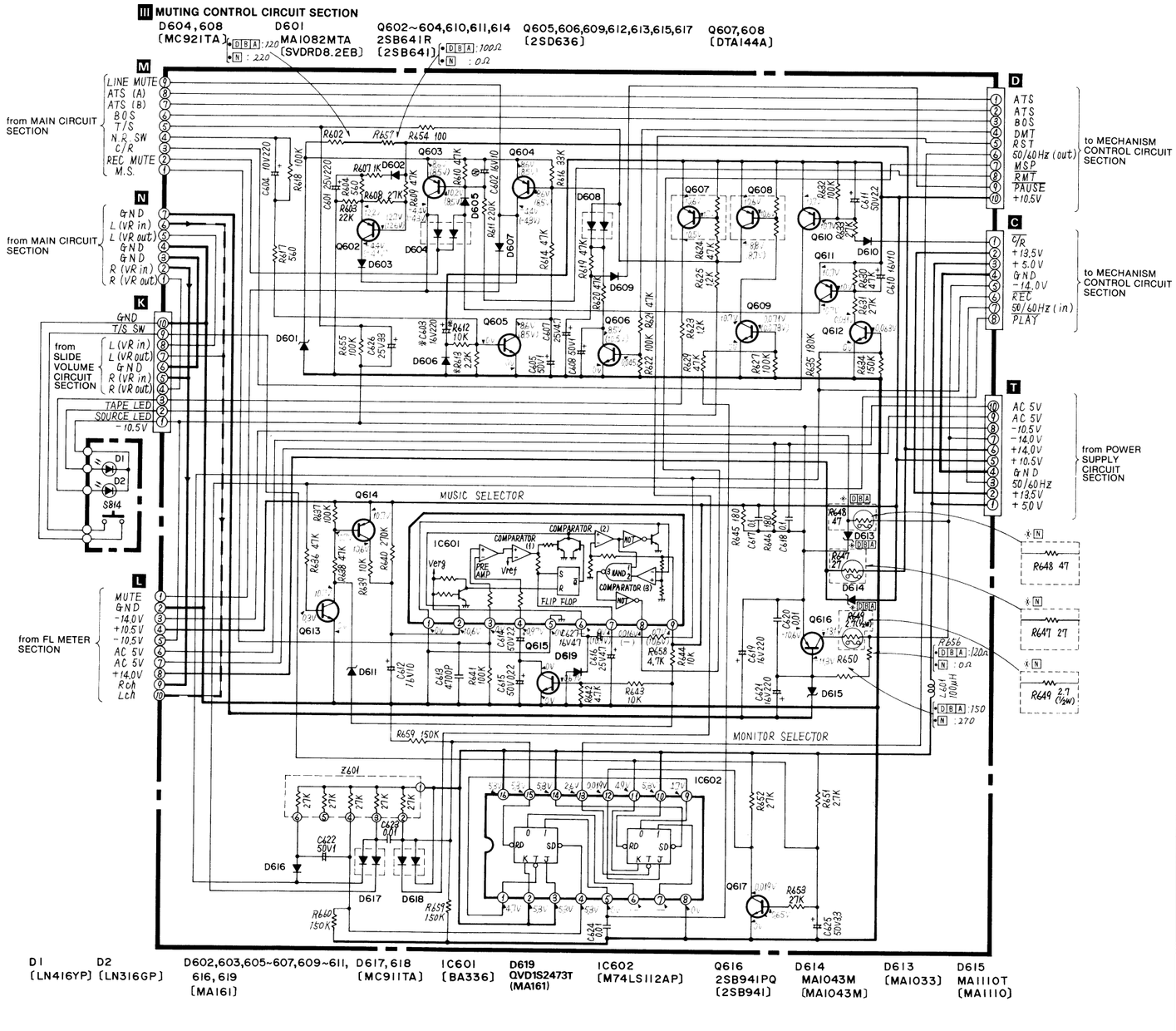
SPECIFICATIONS

Playback S/N ratio * Test tape...QZZCFM	Greater than 45dB
Overall distortion * Test tape ...QZZCRA for Normal ...QZZCRX for CrO_2 ...QZZCRZ for Metal	Less than 3%
Overall S/N ratio *Test tape...QZZCRA	Greater than 43dB (without NAB filter)

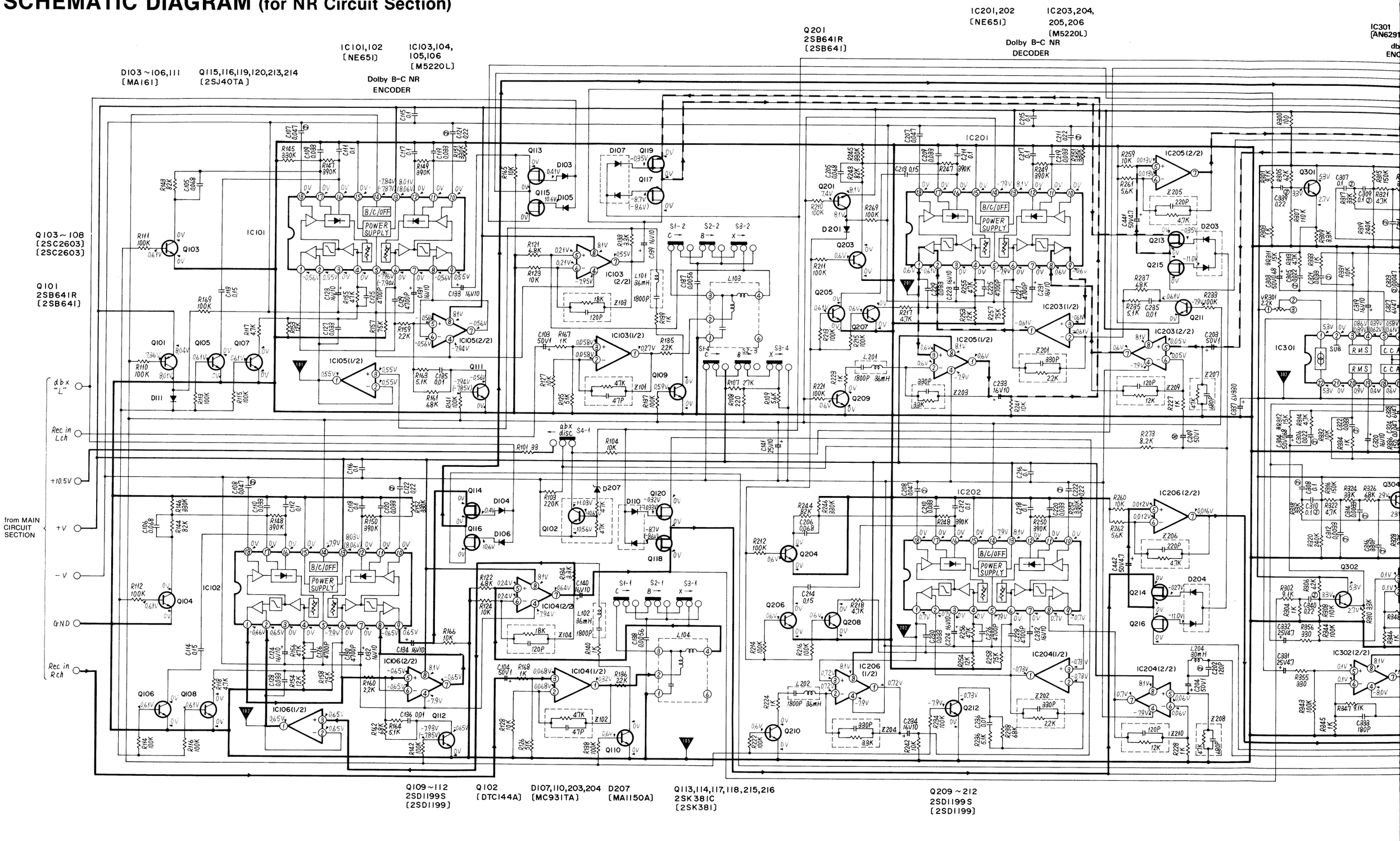


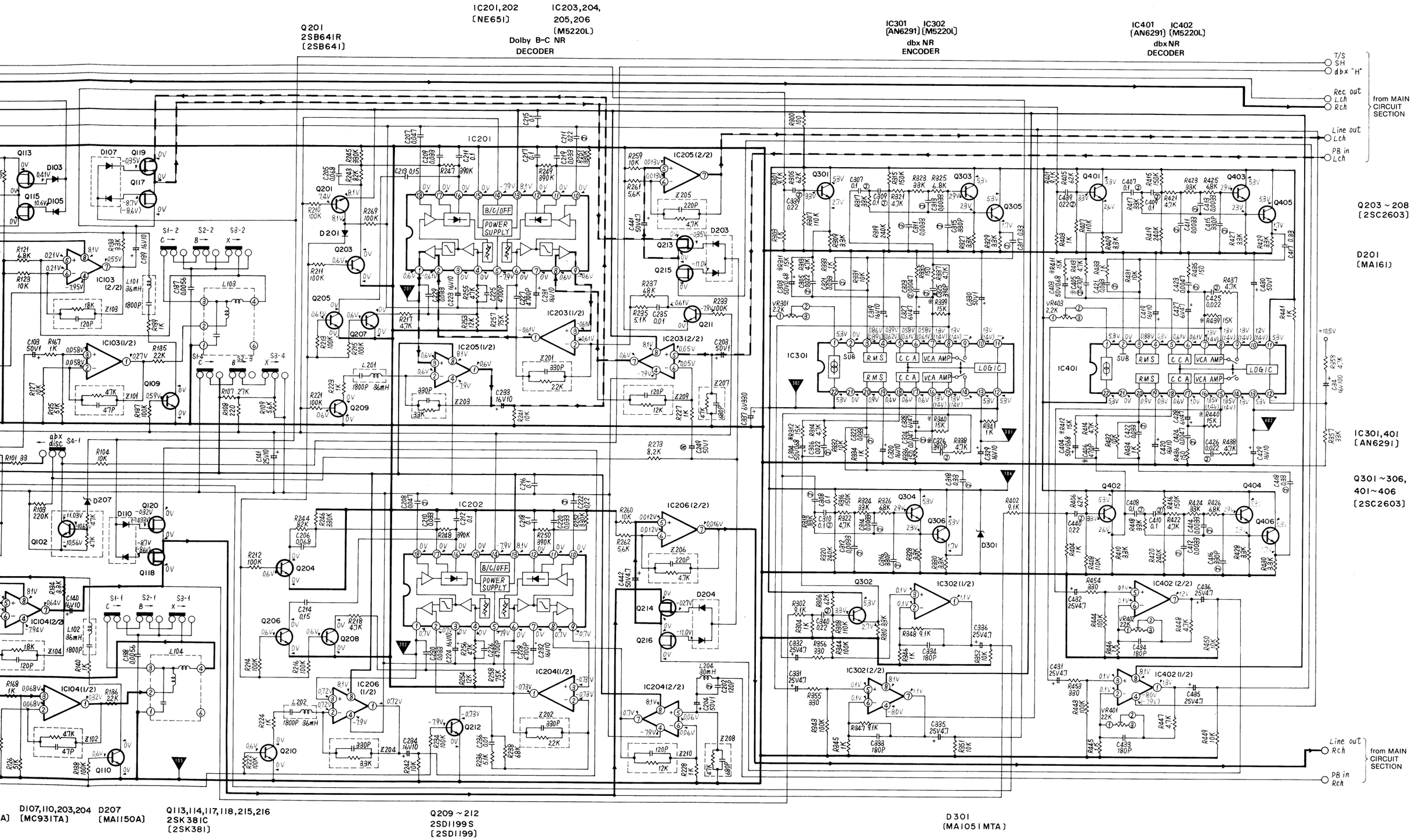
NOTES:

- [D] ..... For all European areas except United Kingdom.
- [B] ..... For United Kingdom.
- [N] ..... For Asia, Latin America, Middle East and Africa areas.
- [A] ..... For Australia.



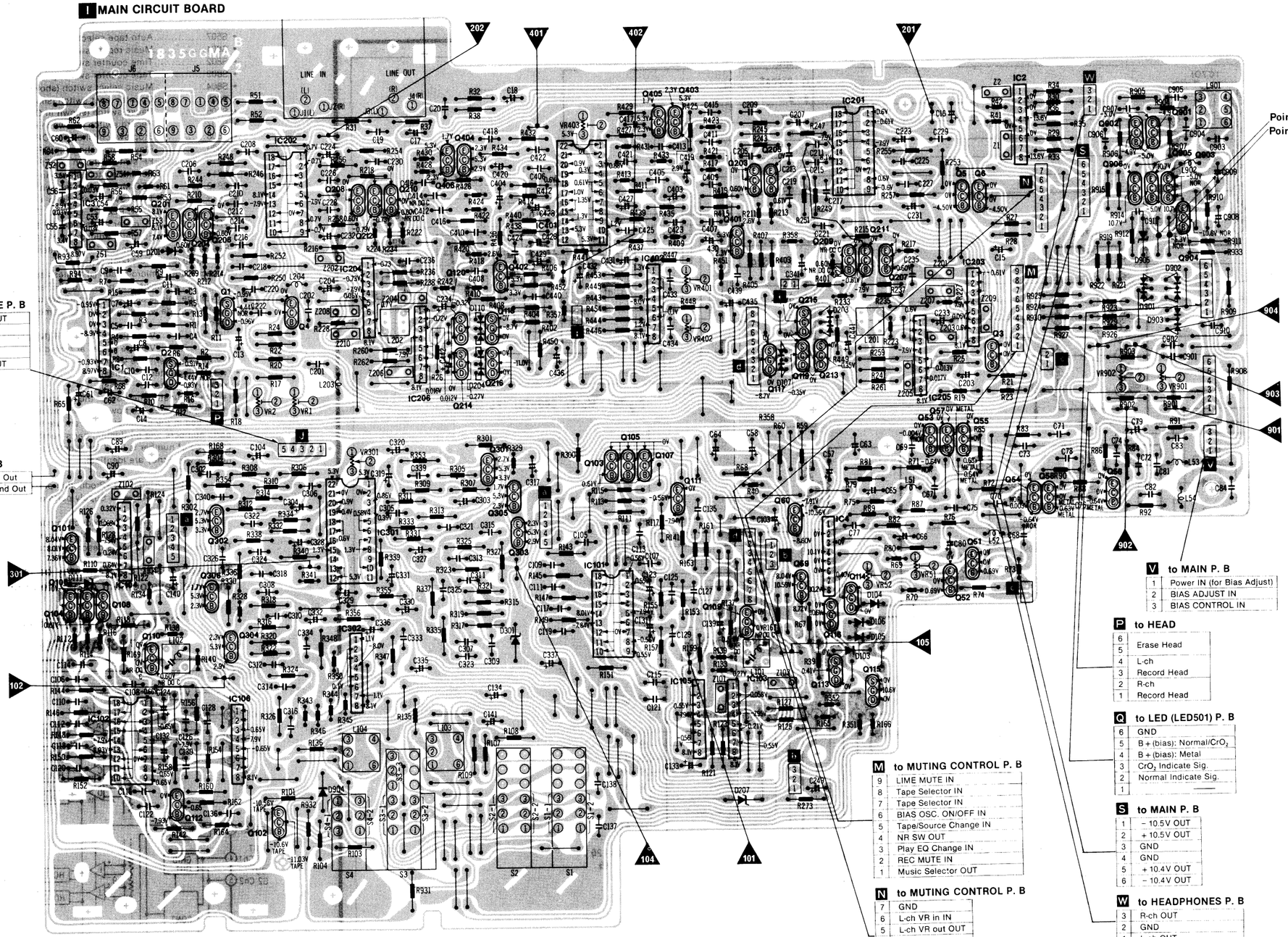
SCHEMATIC DIAGRAM (for NR Circuit Section)




Q201
2SB641R
[2SB641]
IC201,202
[NE651]
IC203,204,
205,206
(M5220L)
Dolby B-C NR
DECODER
IC301 IC302
[AN6291] [M5220L]
dbx NR
ENCODER
IC401 IC402
[AN6291] [M5220L]
dbx NR
DECODER
T/S
SH
dbx "H"
Rec out
Lch
Rch
Line out
Lch
PB in
Lch
from MAIN
CIRCUIT
SECTION
Q203 ~ 208
[2SC2603]
D201
(MA161)
IC301,401
[AN6291]
Q301 ~306,
401~406
[2SC2603]
Line out
Rch
PB in
Rch
from MAIN
CIRCUIT
SECTION
D107,110,203,204
[MC931TA]
D207
[MA1150A]
Q113,114,117,118,215,216
2SK381C
[2SK381]
Q209 ~ 212
2SD1199S
[2SD1199]
D301
(MA1051MTA)

CIRCUIT BOARDS (for Main/Power Supply Circuit Boards)

I MAIN CIRCUIT BOARD



J to SLIDE VOLUME P. B

1	R-ch (REC Signal) OUT
2	R-ch (REC Signal) IN
3	—
4	L-ch (REC Signal) IN
5	L-ch (REC Signal) OUT

O from FL METER P. B

3	MIC Indicate Command Out
1	J BAR Indicate Command Out

M to MUTING CONTROL P. B

9	LIME MUTE IN
8	Tape Selector IN
7	Tape Selector IN
6	BIAS OSC. ON/OFF IN
5	Tape/Source Change IN
4	NR SW OUT
3	Play EQ Change IN
2	REC MUTE IN
1	Music Selector OUT

N to MUTING CONTROL P. B

7	GND
6	L-ch VR in IN
5	L-ch VR out OUT
4	GND
3	GND
2	R-ch VR in IN
1	R-ch VR out OUT

V to MAIN P. B

1	Power IN (for Bias Adjust)
2	BIAS ADJUST IN
3	BIAS CONTROL IN

P to HEAD

6	
5	Erase Head
4	L-ch
3	Record Head
2	R-ch
1	Record Head

Q to LED (LED501) P. B

6	GND
5	B+(bias): Normal/CrO_2
4	B+(bias): Metal
3	CrO_2 Indicate Sig.
2	Normal Indicate Sig.
1	

S to MAIN P. B

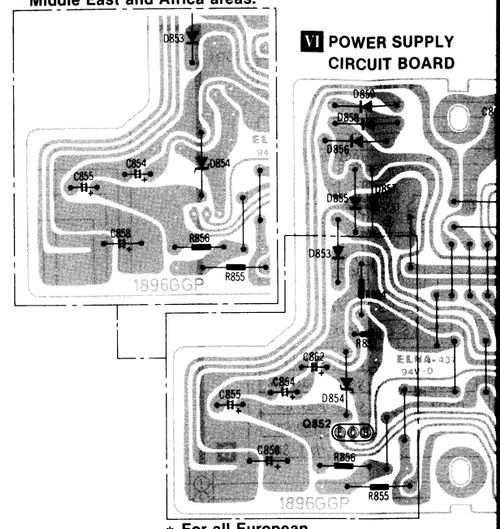
1	− 10.5V OUT
2	+ 10.5V OUT
3	GND
4	GND
5	+ 10.4V OUT
6	− 10.4V OUT

W to HEADPHONES P. B

3	R-ch OUT
2	GND
1	L-ch OUT

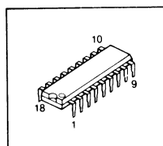
* For Asia, Latin America, Middle East and Africa areas.

VI POWER SUPPLY CIRCUIT BOARD

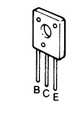


* For all European areas and Australia.

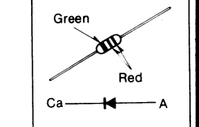
TERMINATIONS & CONNECTORS



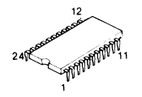
IC101, 102, 201, 202



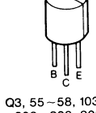
Q903



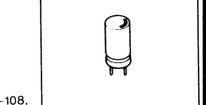
D301



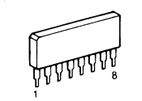
IC301, 401



Q3, 55～58, 103～108, 202～208, 301～306, 402～406

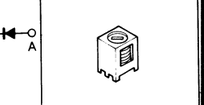


L53, 54, 203, 204, 902

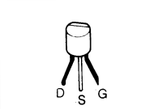


IC1～4, 103～106, 203～206, 302, 402

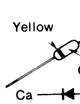
D107, 110, 203, 204, 901～903



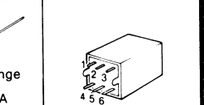
L101, 102, 201, 202



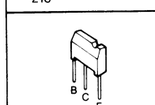
Q1, 2, 113～120, 213～216



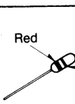
D103～106, 111, 201, 904



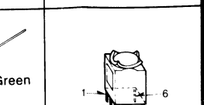
L901



Q5, 6, 51～54, 59, 101, 102, 109～112, 201, 209～212, 901, 902, 904～906



D207



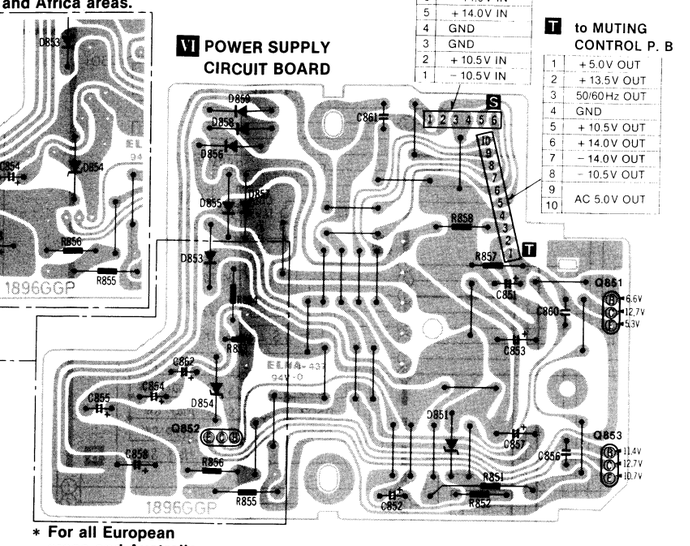
L103, 104

NOTES:

- The circuit shown in [illegible] on the conductor side indicates printed circuit on the back side of the printed circuit board.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position.
  For measurement, use VTVM.

• This circuit board diagram may be modified at any time with the development of new technology.

tin America,
and Africa areas.



* For all European areas and Australia.

IONS & CONNECTORS

	Q903	D301	L51, 52	5 Pin CN6
	Q3, 55 – 58, 103 – 108, 202 – 208, 301 – 306, 402 – 406	L53, 54, 203, 204, 902	3 Pin CN1, CN3, CN4	9 Pin CN8
	D107, 110, 203, 204, 901 – 903	L101, 102, 201, 202		7 Pin CN7
	D103 – 106, 111, 201, 904	L901	6 Pin CN1, CN2, CN5	6 Pin CN9
	D207	L103, 104		

ELECTRICAL PARTS LIST

REPLACEMENT PARTS LIST

Important safety notice
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

NOTES: RESISTORS
ERD.....Carbon
ERG .....Metal-oxide
ERS.....Metal-oxide
ERO .....Metal-film
ERX.....Metal-film
ERQ .....Fuse type metallic
ERC.....Solid
ERF.....Cement

CAPACITORS
ECBA .....Ceramic
ECG□ .....Ceramic
ECK□ .....Ceramic
ECC□ .....Ceramic
ECF□ .....Ceramic
ECQM .....Polyester film
ECQE .....Polyester film
ECQF .....Polypropylene

ECE□ .....Electrolytic
ECE□N ...Non polar electrolytic
ECQS .....Polystyrene
ECS□ .....Tantalum
QCS .....Tantalum

Ref. No.	Part No.
RESISTORS	
R 1, 2	ERD25TJ473
R 3, 4	ERD25FJ101
R 5, 6	ERD25FJ221
R 7, 8	ERD25TJ824
R 9, 10	ERD25TJ183
R 11, 12	ERD25TJ123
R 13, 14	ERD25TJ225
R 15, 16	ERD25TJ104
R 17, 18	ERD25TJ183
R 19, 20	ERD25FJ332
R 21, 22	ERD25FJ271
R 23, 24	ERD25FJ103
R 25, 26	ERD25FJ471
R 27, 28	ERD25FJ681
R 29, 30	ERD25TJ333
R 31, 32	ERD25TJ473
R 33, 34	ERD25FJ121
R 35, 36	ERD25FJ680
R 37, 38	ERD25FJ102
R 39, 40	ERD25FJ332
R 41, 42	ERD25TJ333
R 51, 52	ERD25FJ273
R 53, 54	ERD25FJ102
R 55, 56	ERD25FJ273
R 57, 58	ERD25FJ102
R 59, 60	ERD25FJ221
R 61, 62	ERD25FJ102
R 63, 64	ERD25TJ104
R 65, 66	ERD25FJ221
R 67, 68	ERD25FJ561
R 69, 70	ERD25FJ103
R 71, 72	ERD25FJ821
R 73, 74	ERD25FJ103
R 75, 76	ERD25FJ330
R 79, 80	ERD25FJ822
R 81, 82	ERD25FJ392
R 83, 84, 85, 86, 87, 88	ERD25FJ272
R 89, 90	ERD25FJ392
R 91, 92	ERD25FJ562
R 93, 94	ERD25TJ684
R 101	ERD25FJ330
R 103	ERD25TJ224
R 104	ERD25FJ103
R 107	ERD25FJ273
R 108	ERD25FJ221
R 109	ERD25FJ562
R 110, 111, 112, 113, 114, 115, 116	ERD25TJ104
R 117, 118	ERD25FJ472
R 121, 122	ERD25FJ682
R 123, 124	ERD25FJ103
R 125, 126	ERD25TJ513
R 127, 128	ERD25FJ103
R 133, 134	ERD25FJ332
R 135, 136	ERD25FJ222
R 137, 138	ERD25TJ104
R 139, 140	ERD25FJ102
R 141, 142	ERD25TJ104
R 143, 144	ERD25TJ823
R 145, 146	ERD25TJ334
R 147, 148, 149, 150	ERD25TJ394
R 151, 152	ERD25TJ334
R 153, 154	ERD25TJ123
R 155, 156	ERD25TJ473
R 157, 158	ERD25TJ753
R 159	ERD25FJ222
R 160	ERD25FJ222
R 161, 162	ERD25TJ683
R 163, 164	ERD25FJ512
R 165, 166	ERD25FJ103
R 167, 168	ERD25FJ102
R 169	ERD25TJ104
R 210, 211, 212, 213, 214, 215, 216	ERD25TJ104
R 217, 218	ERD25FJ472
R 221, 222	ERD25TJ104
R 223, 224	ERD25FJ102
R 227, 228	ERD25FJ102
R 233, 234	ERD25TJ104
R 235, 236	ERD25FJ512
R 237, 238	ERD25TJ683
R 241, 242	ERD25FJ103
R 243, 244	ERD25TJ823
R 245, 246	ERD25TJ334
R 247, 248, 249, 250	ERD25TJ394
R 251, 252	ERD25TJ334
R 253, 254	ERD25TJ123
R 255, 256	ERD25TJ473
R 257, 258	ERD25TJ753
R 259, 260	ERD25FJ103
R 261, 262	ERD25FJ562
R 269	ERD25TJ104
R 273	ERD25FJ822
R 300	ERD25FJ101
R 301, 302	ERD25FJ912
R 303, 304	ERD25FJ102
R 305, 306	ERD25TJ623
R 307, 308	ERD25TJ114
R 309, 310	ERD25FJ332
R 311, 312	ERD25TJ153
R 313, 314	ERD25FJ472
R 315, 316	ERD25TJ154
R 317, 318	ERD25TJ333
R 319, 320	ERD25TJ244
R 321, 322	ERD25FJ472
R 323, 324	ERD25TJ333
R 325, 326	ERD25FJ682
R 327, 328, 329, 330	ERD25FJ332
R 331, 332	ERD25FJ103
R 333, 334	ERD25FJ102
R 335, 336	ERD25FJ151
R 337, 338	ERD25FJ472
R 339, 340	ERD25TJ153
R 341	ERD25FJ102
R 343, 344	ERD25TJ104
R 345, 346	ERD25FJ102
R 347, 348	ERD25FJ912
R 351, 352	ERD25FJ103
R 355, 356	ERD25FJ331
R 357	ERD25TJ333
R 358	ERD25FJ472
R 401, 402	ERD25FJ912
R 403, 404	ERD25FJ102
R 405, 406	ERD25TJ623
R 407, 408	ERD25TJ114
R 409, 410	ERD25FJ332
R 411, 412	ERD25TJ153
R 413, 414	ERD25FJ472
R 415, 416	ERD25TJ154
R 417, 418	ERD25TJ333
R 419, 420	ERD25TJ244
R 421, 422	ERD25FJ472
R 423, 424	ERD25TJ333
R 425, 426	ERD25FJ682
R 427, 428, 429, 430	ERD25FJ332
R 431, 432	ERD25FJ103
R 433, 434	ERD25FJ102
R 435, 436	ERD25FJ151
R 437, 438	ERD25FJ472
R 439, 440	ERD25TJ153
R 441	ERD25FJ102
R 443, 444	ERD25TJ104
R 445, 446	ERD25FJ102
R 447, 448	ERD25FJ472
R 449, 450	ERD25FJ103
R 453, 454	ERD25FJ331
R 501	ERD25TJ223
R 602 [DBA]	ERD25FJ121
[For all European areas and Australia.] [N]	ERD25FJ221
[For Asia, Latin America, Middle East and Africa areas.]	
R 603	ERD25TJ223
R 604	ERD25FJ561
R 607	ERD25FJ102
R 608	ERD25TJ273
R 609, 610	ERD25TJ473
R 611	ERD25TJ224
R 612	ERD25FJ103
R 613	ERD25FJ222
R 614	ERD25TJ473
R 616	ERD25TJ333
R 617	ERD25FJ561
R 618	ERD25TJ104
R 619, 620, 621	ERD25TJ473
R 622	ERD25TJ104
R 623	ERD25FJ122
R 624	ERD25TJ473
R 625	ERD25FJ122
R 627	ERD25TJ104
R 629, 630	ERD25TJ473
R 631	ERD25TJ273
R 632	ERD25TJ104
R 633	ERD25TJ273
R 634	ERD25TJ154
R 635	ERD25TJ184
R 636	ERD25TJ473
R 637	ERD25TJ104
R 638	ERD25TJ473
R 639	ERD25FJ103
R 640	ERD25TJ274
R 641	ERD25TJ104
R 642	ERD25FJ472
R 643, 644	ERD25FJ103
R 645, 646	ERD25FJ181
R 647 [DBA]	ERQ14AJ270
[For all European areas and Australia.] [N]	ERD25FJ270
[For Asia, Latin America, Middle East and Africa areas.]	
R 648 [DBA]	ERQ14AJ470
[For all European areas and Australia.] [N]	ERD25FJ470
[For Asia, Latin America, Middle East and Africa areas.]	
R 649 [DBA]	ERQ12HJ2R7
[For all European areas and Australia.] [N]	ERX12ANJ2R7
[For Asia, Latin America, Middle East and Africa areas.]	
R 650 [DBA]	ERD25FJ151
[For all European areas and Australia.] [N]	ERD25FJ271
[For Asia, Latin America, Middle East and Africa areas.]	
R 651	ERD25FJ272
R 652, 653	ERD25TJ273
R 654	ERD25FJ101
R 655	ERD25TJ104
R 656 [DBA]	ERD25FJ121
[For all European areas and Australia.]	
R 657 [DBA]	ERD25FJ101
[For all European areas and Australia.]	
R 658	ERD25FJ472
R 659, 660	ERD25TJ154
R 701, 702, 703, 704	ERD25FJ471
R 705 [DBA]	ERQ12HJ100
[For all European areas and Australia.] [N]	ERD25FJ100
[For Asia, Latin America, Middle East and Africa areas.]	
R 706	ERD25FJ103
R 707, 708	ERD25TJ683
R 709	ERD25FJ471
R 710	ERD25TJ684
R 711	ERD25FJ472
R 712	ERD25FJ182
R 713	ERD50FJ221
R 714	ERD25FJ103
R 715	ERD25TJ104
R 716	ERD25FJ332
R 717, 718	ERD25FJ222
R 719, 720	ERD25TJ224
R 721, 722	ERD25TJ563
R 723, 724	ERD25TJ683
R 725, 726	ERD25TJ154
R 727, 728, 729, 730	ERD25FJ562
R 731, 732	ERD25FJ472
R 733, 734	ERD25TJ684
R 735	ERD25FJ103
R 736, 737	ERD25TJ473
R 738	ERD25FJ103
R 739	ERD25TJ104
R 740	ERD25FJ222
R 801	ERD25FJ681
R 802	ERD25FJ821
R 803, 804	ERD25FJ102
R 807, 808, 809, 810	ERD25TJ273
R 811	ERD25FJ562
R 812	ERD25FJ102
R 813	ERD25FJ222
R 814	ERD25TJ473
R 815	ERD25FJ471
R 816	ERD25FJ562
R 817	ERD25FJ681
R 818	ERD25FJ103
R 819	ERD25FJ332
R 820	ERD25FJ103
R 821	ERD25TJ223
R 822 [DBA]	ERD25FJ102
[For all European areas and Australia.]	
R 823	ERD25FJ681
R 824	ERD25FJ272
R 851 ⚠	ERX2ANJ5R6
R 852 ⚠	ERD25FJ222
R 853, 854 [DBA]	ERD25TJ153
[For all European areas and Australia.]	
R 855 [DBA] ⚠	ERQ12HJ2R7
[For all European areas and Australia.] [N] ⚠	ERX12ANJ2R7
[For Asia, Latin America, Middle East and Africa areas.]	
R 856 ⚠	ERD25FJ271
R 857	ERD25FJ103
R 858 [DBA] ⚠	ERD25FJ122
[For all European areas and Australia.] [N] ⚠	ERD25FJ222
[For Asia, Latin America, Middle East and Africa areas.]	
R 901, 902	ERD25FJ100
R 903	ERD25FJ1R0
R 904, 905	ERD25TJ223
R 906, 907	ERD25FJ270
R 908	ERD25FJ561
R 909	ERD25FJ222
R 910, 911	ERD25FJ561
R 912	ERD25FJ122
R 914	ERD25FJ562
R 915	ERD25TJ473
R 919	ERD25FJ681
R 921	ERD25FJ102
R 922, 923	ERD25FJ103
R 924	ERD25TJ563
R 925	ERD25FJ332
R 926	ERD25FJ103
R 927	ERD25TJ333
R 928	ERD25FJ152
R 929	ERD25TJ104
R 930	ERD25TJ124
R 931, 932	ERD25TJ104
R 933	ERD25FJ332

VARIABLE RESISTORS

VR 1, 2	QVNB3A00B223
VR 3	QVBL1PUA14
VR 4	QVBP1PUA54
VR 5	QVAV5KUG15
VR 51, 52	QVNB3A00B223
VR 301	QVNB3A00B222
VR 401, 402	QVNB3A00B223
VR 403	QVNB3A00B222
VR 701	QVNB3A00B223
VR 702	QVNB3A00B472
VR 901, 902	QVNB3A00B104
VR 903	QVJFAF20B13

CAPACITORS

C 3, 4	ECCD1H151K
C 7, 8	ECEA1AS101
C 9, 10	ECQM1H392JZ
C 11, 12	ECCD1H221K
C 13, 14	ECEA25Z4R7
C 15, 16, 17, 18	ECEA1HS100
C 19, 20	ECKD1H102KB
C 53, 54	ECEA25Z4R7
C 55, 56	ECCD1H820K
C 57, 58	ECEA1AS101
C 59, 60	ECEA25Z4R7
C 61, 62, 63, 64	ECEA1AS101
C 65, 66	ECEA50ZR47
C 67	ECQV05223JZ
C 68	ECQM1H223JZ
C 69, 70	ECQM1H682JZ
C 71, 72	ECQM1H273JZ
C 73, 74	ECQM1H103JZ
C 75	ECQV05473JZ
C 76	ECQM1H473JZ
C 77, 78	ECQM1H682JZ
C 79, 80	ECEA50Z2R2
C 81, 82	ECQM1H152JZ
C 83, 84	ECKD2H121KB
C 89, 90	ECEA1HS100
C 103, 104	ECEA50Z1
C 105	ECQV05683JZ
C 106	ECQM1H683JZ
C 107, 108	ECQM1H473JZ
C 109, 110	ECQM1H333JZ
C 111, 112	ECQV05104JZ
C 113, 114	ECQV05154JZ
C 115, 116, 117, 118	ECQV05104JZ
C 119, 120	ECQM1H333JZ
C 121, 122	ECQV05224JZ
C 123, 124	ECEA1HS100
C 125, 126	ECQM1H472JZ
C 127, 128	ECQM1H333JZ
C 129, 130	ECQM1H472JZ
C 131, 132, 133, 134	ECEA1HS100
C 135, 136	ECQM1H103JZ
C 137, 138	ECQM1H562JZ
C 139, 140, 141	ECEA1HS100
C 201, 202	ECCD1H121J
C 203, 204	ECEA50Z1
C 205, 206	ECQM1H683JZ
C 207, 208	ECQM1H473JZ
C 209, 210	ECQM1H333JZ
C 211, 212	ECQV05104JZ
C 213, 214	ECQV05154JZ
C 215, 216, 217, 218	ECQV05104JZ
C 219, 220	ECQM1H333JZ
C 221, 222	ECQV05224JZ
C 223, 224	ECEA1HS100
C 225, 226, 227, 228	ECQM1H472JZ
C 229, 230	ECQM1H333JZ
C 231, 232, 233, 234	ECEA1HS100
C 235, 236	ECQM1H103JZ
C 249	ECEA1HN010
C 303, 304	ECEA50MR68R
C 305, 306	ECQM1H223JZ
C 307, 308, 309, 310	ECQV05104JZ
C 311, 312, 313, 314	ECQM1H332JZ
C 315, 316	ECCD1H331J
C 317, 318	ECQV05334JZ
C 319, 320	ECEA16Z10
C 321, 322	ECQM1H333JZ
C 323, 324	ECQM1H472JZ
C 325, 326	ECCD1H391J
C 327, 328	ECEA1AS470
C 329	ECEA1HS100
C 330	ECEA50Z1
C 331, 332	ECEA25Z4R7
C 333, 334	ECCD1H181K
C 335, 336	ECEA25Z4R7
C 337	ECEA1AS331
C 339, 340	ECQV05224JZ
C 341	ECEA1ES101
C 403, 404	ECEA50MR68R
C 405, 406	ECCD1H471J
C 407, 408, 409, 410	ECQV05104JZ
C 411, 412, 413, 414	ECQM1H332JZ
C 415, 416	ECCD1H331J
C 417, 418	ECQV05334JZ
C 419, 420	ECEA16Z10
C 421, 422	ECQV05333JZ
C 423, 424	ECQM1H472JZ
C 425, 426	ECQM1H223JZ
C 427, 428	ECEA1AS470
C 429	ECEA1HS100
C 430	ECEA50Z1
C 431, 432	ECEA25Z4R7
C 433, 434	ECCD1H181K
C 435, 436	ECEA25Z4R7
C 439, 440	ECQV05224JZ
C 441, 442	ECEA50Z4R7
C 601	ECEA1ES221
C 602	ECEA1CN100
C 603	ECEA1CS221
C 604	ECEA1AS221
C 605	ECEA50Z1
C 607	ECEA1ES4R7
C 608	ECEA50Z1
C 610	ECEA1HS100
C 611	ECEA50Z2R2
C 612	ECEA16MR10R
C 613	ECQM1H472JZ
C 614	ECEA50Z2R2
C 615	ECEA50ZR22
C 616	ECEA1ES4R7
C 617, 618	ECQV05104JZ
C 619	ECEA1CS221
C 620	ECFDD103KVY
C 621	ECEA1CS221
C 622	ECEA1HN010
C 623, 624	ECKD1H103ZF
C 625	ECEA50Z3R3
C 626	ECEA1VS330
C 627	ECEA1CN470
C 702	ECEA1ES101
C 703	ECEA1HS100
C 704	ECFDD473KXY
C 705, 706	ECEA50ZR47
C 707, 708	ECEA1HS100
C 709, 710	ECEA50Z1
C 801	ECQV05104JZ
C 802, 803	ECKD1H392KB
C 804	ECEA50ZR1
C 805	ECKD1H102KB
C 806	ECEA1HS100
C 807	ECEA1AS221
C 808	ECKD1H333ZF
C 851	ECEA1HS100
C 852 ⚠	ECEA1AS470
C 853 ⚠	ECEA1CS222
C 854, 855	ECEA1CS221
C 856	ECKD1H103ZF
C 857 ⚠	ECEA1ES332
C 858 ⚠	ECEA1CS222
C 859 ⚠	ECQU2A103MF
C 860	ECKD1H103ZF
C 861 ⚠	ECKD1H103ZF
C 862 [DBA]	ECEA1CS330
[For all European areas and Australia.]	
C 901, 902	ECCD1H101K
C 903	ECQP1223JZ
C 904	ECQM1H392JZ
C 905, 906, 907	ECQM1H472JZ
C 908	ECEA50Z4R7
C 909	ECEA1JS220
C 910	ECQV05104JZ
C 911	ECKD1H102KB

COMBINATION PARTS

Z 1, 2	EXRP101K124
Z 51, 52	EXRP220K124
Z 53, 54	EXRP152K473
Z 101, 102	EXRP470K473
Z 103, 104	EXRP121K183
Z 201, 202	EXRP331K222
Z 203, 204	EXRP331K332
Z 205, 206	EXRP221K472
Z 207, 208	EXRP681K473
Z 209, 210	EXRP121K123
Z 601	EXBEQ5273K
Z 801	EXBEQ5273K
Z 802	EXBD88254K
Z 803	EXBD86181K
Z 804	EXBEQ4272K

TRANSISTORS

Q 1, 2	2SK381
Q 3, 4	2SC2603E
Q 5, 6	2SD1330
Q 51, 52	2SD1330
Q 53, 54	2SB641
Q 55, 56, 57, 58	2SC2603E
Q 59	2SD638
Q 60	2SB643
Q 101	2SB641
Q 102	DTC144A
Q 103, 104, 105, 106, 107, 108	2SC2603E
Q 109, 110, 111, 112	2SD1199
Q 113, 114	2SK381
Q 115, 116	2SJ40
Q 117, 118	2SK381
Q 119, 120	2SJ40
Q 201	2SB641
Q 203, 204, 205, 206, 207, 208	2SC2603E
Q 209, 210, 211, 212	2SD1199
Q 213, 214	2SJ40
Q 215, 216	2SK381
Q 301	2SC2603E
Q 306	2SC2603E
Q 401, 402, 403, 404, 405, 406	2SC2603E
Q 602, 603, 604	2SB641
Q 605, 606	2SD636
Q 607, 608	DTA144A
Q 609	2SD636
Q 610, 611	2SB641
Q 612, 613	2SD636
Q 614	2SB641
Q 615	2SD636
Q 616	2SB941
Q 617	2SD636
Q 701	2SB641
Q 702, 703, 704	2SD636
Q 705	2SB641
Q 801, 802, 803, 804, 805	2SB643
Q 806	2SD636
Q 851	2SD1275
Q 852 [DBA]	2SD636
[For all European areas and Australia.]	
Q 853	2SD1265
Q 901, 902	2SD1225
Q 903	2SD946
Q 904	2SB793
Q 905	2SB641
Q 906	DTC144A

DIODES & RECTIFIERS

D 1	LN416YP
D 2	LN316GP
D 103, 104, 105, 106	MA161
D 107	MC931TA
D 110	MC931TA
D 111	MA161
D 201	MA161
D 203, 204	MC931TA
D 207	MA1150A
D 301	MA1051
D 501, 502, 503, 504	MA161
D 601	SVDRD8.2EB
D 602, 603	MA161
D 604	MC921TA
D 605, 606, 607	MA161
D 608	MC921TA
D 609, 610, 611	MA161
D 613	MA1033
D 614	MA1043M
D 615	MA1110
D 616	MA161
D 617, 618	MC911TA
D 619	MA161
D 701	SVDRD8.2EB
D 702, 703	MA161
D 704	MC921TA
D 706, 707, 708	MA161
D 801, 802, 803, 804, 805	MA161
D 806	refer to S806
D 807	refer to S809
D 809	refer to S807
D 810, 811, 812, 813, 814	MA161
D 851 ⚠	RVDRD6R8EB
D 853 ⚠	SM112
D 854 ⚠	MA1110M
D 855, 856, 857, 858, 859	SM112
D 901, 902, 903	MC921TA
D 904	MA161
D 905	MA1043M

LIGHT EMITTING DIODE

LED 501	QVDLS003M

INTEGRATED CIRCUITS

IC 1	M5220L
IC 2	M5218L
IC 3	M5220L
IC 4	M5218L
IC 101, 102	NE651N
IC 103, 104, 105, 106	M5220L
IC 201, 202	NE651N
IC 203, 204, 205, 206	M5220L
IC 301	AN6291
IC 302	M5220L
IC 401	AN6291
IC 402	M5220L
IC 501	DN6838
IC 601	BA336
IC 602	M74LS112AP
IC 701, 702	AN6280
IC 703	AN6870N
IC 704	BA6138
IC 705	M5218L
IC 801	MN1405RMB
IC 802	M74LS04P
IC 803	AN6270

I. C PROTECTOR

ICP 501	QRUF10WH

RESONATOR

X 801	EF0A600K01C

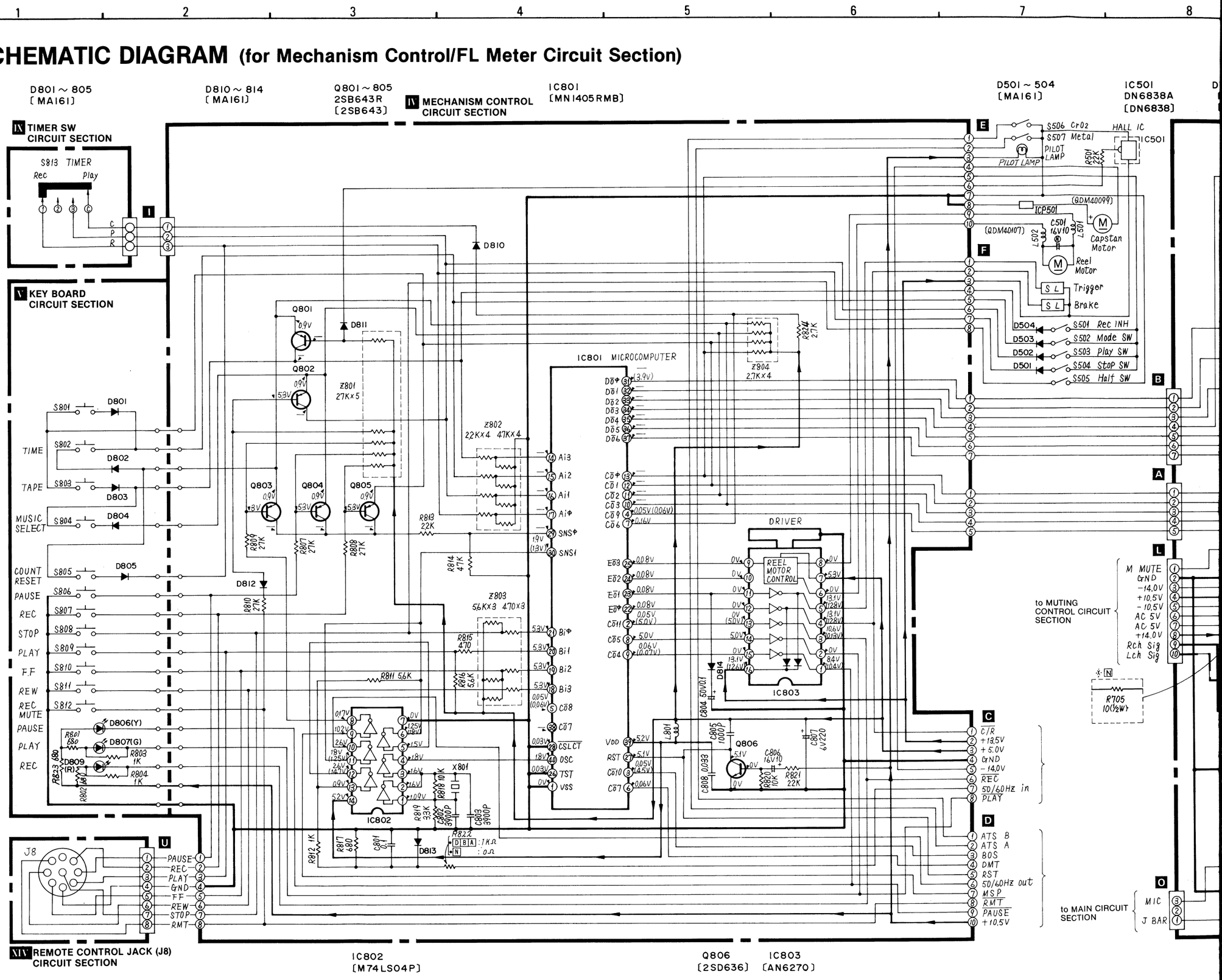
Ref. No.	Part No.	Part Name & Description
TRANSFORMER		
T 1 [DB] ⚠	QLPD77ELX	AC Power Transformer [For all European areas.]
[NA] ⚠	QLPA71ELX	AC Power Transformer [For Australia, Asia, Latin America, Middle East and Africa areas.]

REPLACEMENT PARTS LIST

Important safety notice
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

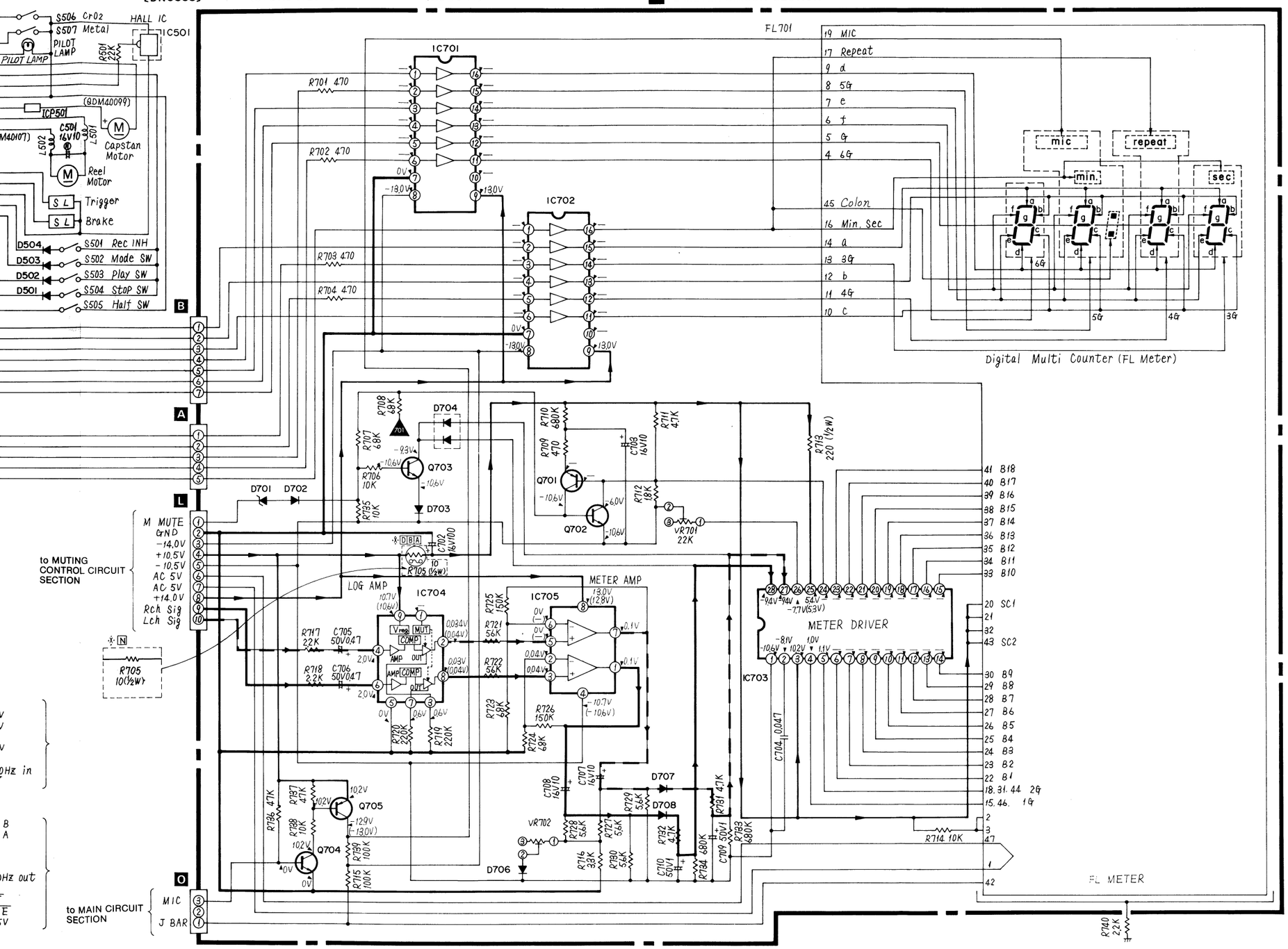
Ref. No.	Part No.	Part Name & Description
		COILS
L 51, 52	QLQX2722D	Peaking Coil
L 53, 54	QLQX0343KWA	Bias Trap Coil
L 101, 102	ELM7Q306A	Skewing Network
L 103, 104	ELM10Q201F	M.P.X. Coil
L 201, 202	ELM7Q306A	Skewing Network
L 203, 204	QLQX0343KWA	Bias Trap Coil
L 501, 502	QLQZ1014D	Choke Coil
L 601	ELEH101KA	Choke Coil
L 801	ELEH101KA	Choke Coil
L 901	QLB0204	Bias Oscillation Coil
L 902	QLQX0332KWA	Peaking Coil
		FUSE
F 1		
[N] ⚠	XBA2E05NR5	Fuse (0.5A) [For Asia, Latin Aamerica, Middle East and Africa areas.]
		SWITCHES
S 1, 2, 3, 4, 5	QSWX505	Push Switch (NR Selector)
S 501	QSB0289	Leaf Switch (REC Inhibit)
S 502	QSB0287	Leaf Switch (Mode)
S 503	QSB0288	Leaf Switch (Stop)
S 504	QSB0287	Leaf Switch (Play)
S 505	QSB0288	Leaf Switch (Eject)
S 506	QSB0290	Leaf Switch (for CrO_2 Tape)
S 507	QSB0289	Leaf Switch (for Metal Tape)
S 801, 802, 803, 804	QSW1130	Push Switch (Repeat/Time Counter/Tape)
S 805	SSG13	Push Switch (Counter Reset)
S 806	QSW1126	Push Switch with D806 (Pause)
S 807	QSW1124	Push Switch with D809 (REC)
S 808	SSG13	Push Switch (Stop)
S 809	QSW1125	Push Switch with D807
S 810	SSG13	Push Switch (F.F)
S 811, 812	SSG13	Push Switch (Rewind/REC Mute)
S 813	QSS1306	Slide Switch (Timer Start)
S 814	QSW1130	Push Switch (Monitor Tape/Source)
S 851 ⚠	QSW1127	Push Switch (Power ON/OFF)
S 852 ⚠	QSR1407	Rotary Switch (AC Power Voltage Selector)
		JACKS
J 1, 2, 3, 4	QEJ5030C	Jack Board (LINE IN/OUT)
J 5, 6	QJA0453	Jack (Microphone Jack)
J 7	QJA0267H	Headphones Jack
J 8	QJS1955H	Remote Control Socket
		CONNECTORS
CN 1	QJT1054	Contact
CN 2	QJS1922TN	6 Pin Socket
CN 3	QJS1921TN	3 Pin Socket
CN 4	QJP1921TN	3 Pin Plug
CN 5	QJP1922TN	6 Pin Plug
CN 6	QJS1961S	Jumper Socket (5 Pin)
CN 7	QJS1962S	Jumper Socket (7 Pin)
CN 8	QJS1988S	Jumper Socket (9 Pin)
CN 9	QJS1993S	Jumper Socket (6 Pin)
CN 10	QJS1983S	Jumper Socket (8 Pin)
CN 11	QJS1989S	Jumper Socket (10 Pin)
CN 12	QJS1996T	Jumper Socket (14 Pin)
CN 13	QJS1987S	Jumper Socket (4 Pin)
CN 14	QJT1090	Check Pin
CN 15	QJS1989S	Jumper Socket (10 Pin)

SCHEMATIC DIAGRAM (for Mechanism Control/FL Meter Circuit Section)



D501 ~ 504 [MA161] | IC501 DN6838A [DN6838] | D701 MA1043MTA [SVDRD8.2EB] | Q701,705 2SB641R [2SB641] | IC701,702 [AN6280]

II FL METER CIRCUIT SECTION



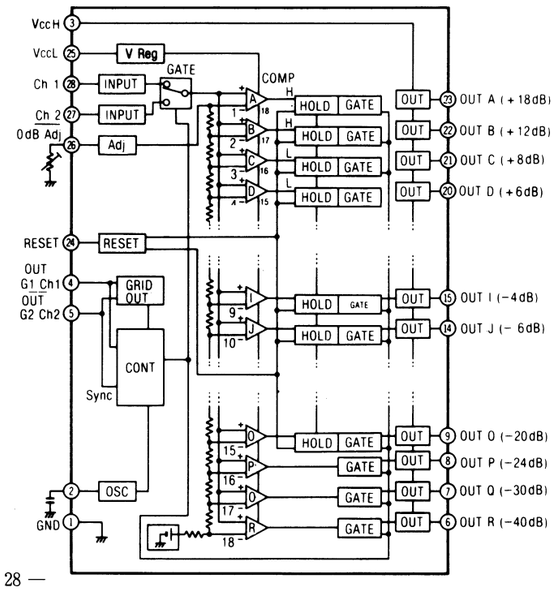
Q702 ~ 704 [2SD636] | IC704 [BA6138] | IC705 [M5218L] | D702,703 [MA161] | D704 [MC921TA] | IC703 [AN6870N] | D707,708 [MA161]

NOTES:

- S501.....REC inhibit switch (shown in OFF position).
- S502.....Mode switch (shown in OFF position).
- S503.....Stop switch (shown in OFF position).
- S504.....Play switch (shown in OFF position).
- S505.....Half switch (shown in OFF position).
- S506.....Auto tape select switch (for CrO_2 tape).
- S507.....Auto tape select switch (for Meatal tape).
- S801.....Music repeat switch (shown in OFF position).
- S802.....Time counter switch (shown in OFF position).
- S803.....Tape counter switch (shown in OFF position).
- S804.....Music select switch (shown in OFF position).
- S805.....Counter reset switch (shown in OFF position).
- S806.....Pause switch (shown in OFF position).
- S807.....Record switch (shown in OFF position).
- S808.....Stop switch (shown in OFF position).
- S809.....Play switch (shown in OFF position).
- S810.....FF switch (shown in OFF position).
- S811.....Rewind switch (shown in OFF position).
- S812.....REC Mute switch (shown in OFF position).
- S813.....Timer switch (shown in 1 position).
  (1...T. REC, 2...OFF, 3...T. PLAY).
- VR701 .....FL meter adjustment VR (−40dB indication).
- VR702 .....FL meter adjustment VR (0dB indication).
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
  1K = 1,000 (Ω), 1M = 1,000k (Ω).
- Capacity are in micro-farads (μF) unless specified otherwise.
- The mark (▼) shows test point. e.g.▼= Test point 1.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherewise specified.
  No mark .....Voltage values at OUT (NR select switch) mode.
  ( ) .....Voltage values at record mode.
  For measurement use VTVM.
- (➡) indicates B+ (bias).
- (➡) indicates B− (bias).
- (➡) indicates the flow of the playback signal. (NR out).
- (➡) indicates the flow of the recording signal. (NR out).
- Described in the schematic diagram are two types of numbers; the supply parts numbers and production parts number for transistors and diodes. One type of number is used for supply parts number and production parts number when they are identical.
  e.g. Q1
  2SC1844(E,F)◀—Production parts number
  [2SC1844E]◀—Supply parts number
  D212 '
  1S2473T77◀—Production parts number
  [MA161]◀—Supply parts number
- The supply parts number is described alone in the replacement parts list.

- **This schematic diagram may be modified at any time with the development of new technology.**

EQUIVALANT CIRCUIT
IC703 AN6870N



CIRCUIT BOARDS (for FL Meter/Mechanism Control/Muting Control/Key Board Circuit Boards)

NOTES:

This product is available in two different types of Muting Control Circuit Boards and Key Board Circuit Boards. For repair and servicing, follow the instructions according to the type used.

- Type-1...RS-M253X sets with marking "B" on the circuit board (shown in Fig. 1).
- Type-2...RS-M253X sets with marking "C" on the circuit board (shown in Fig. 2).

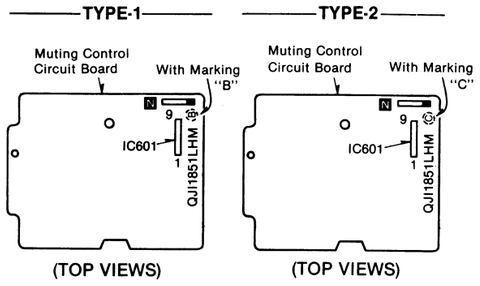


Fig. 1 Fig. 2

NOTES:

- The circuit shown in ▩ on the conductor side indicates printed circuit on the back side of the printed circuit board.
- The circuit shown in ▩ on the conductor indicates printed circuit on the front side of the circuit board, which is put the components.
- The symbols (●) shown in the circuit board indicate connection points between conductors on the front side and back side of the circuit board.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position. For measurement, use VTVM.

- **This circuit board diagram may be modified at any time with the development of new technology.**

NOTES:

- D ..... For all European areas except United Kingdom.
- B ..... For United Kingdom.
- N ..... For Asia, Latin America, Middle East and Africa areas.
- A ..... For Australia.

C to MECHANISM CONTROL P. B

1	Play EQ Change IN
2	+ 13.5V OUT
3	+ 5.0V OUT
4	GND
5	− 14.0V OUT
6	REC COMMAND IN
7	50/60Hz
8	PLAY COMMAND IN

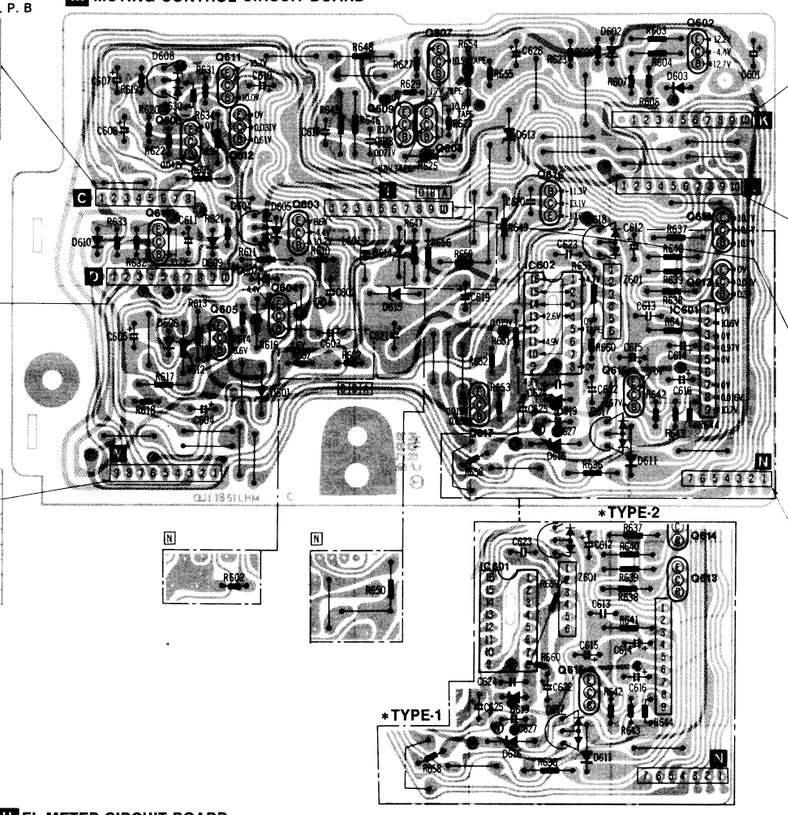
D from MECHANISM CONTROL P. B

1	Tape Selector IN
2	Tape Selector IN
3	BIAS OSC. ON/OFF IN
4	MUTE IN
5	RESET IN
6	50/60Hz IN
7	Music Selector OUT
8	REC MUTE IN
9	PAUSE IN
10	+ 10.5V OUT

M from MAIN P. B

1	Music selector IN
2	REC MUTE OUT
3	Play EQ Change Sig. OUT
4	NR SW IN
5	Tape/Source Change Sig. OUT
6	BIAS OSC. ON/OFF OUT
7	Tape Selector OUT
8	Tape Selector OUT
9	LINE MUTE OUT

III MUTING CONTROL CIRCUIT BOARD



K to SLIDE VOLUME P. B

1	− 10.5V OUT
2	SOURCE LED OUT
3	TAPE LED OUT
4	R-ch VR out OUT
5	R-ch VR in OUT
6	GND
7	L-ch VR in OUT
8	L-ch VR out OUT
9	Tape/Source Change Sig.
10	GND

L to FL METER P. B

1	METER MUTE OUT
2	GND
3	− 14.0V OUT
4	+ 10.5V OUT
5	− 10.5V OUT
6	AC 5.0V OUT
7	
8	+ 14.0V OUT
9	R-ch SIGNAL OUT
10	L-ch SIGNAL OUT

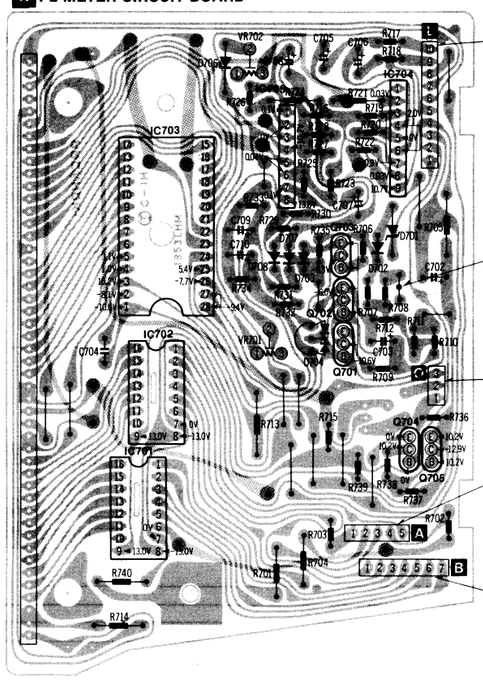
T from POWER SUPPLY P. B

1	+ 5.0V IN
2	+ 13.5V IN
3	50/60 Hz IN
4	GND
5	+ 10.5V IN
6	+ 14.0V IN
7	− 14.0V IN
8	− 10.5V IN
9	
10	AC 5.0V IN

N from MAIN P. B

1	R-ch VR out IN
2	R-ch VR in OUT
3	GND
4	GND
5	L-ch VR out IN
6	L-ch VR in OUT
7	GND

II FL METER CIRCUIT BOARD



L from MUTING CONTROL P. B

10	L-ch SIGNAL IN
9	R-ch SIGNAL IN
8	+ 14.0V IN
7	
6	AC 5.0V IN
5	− 10.5V IN
4	+ 10.5V IN
3	− 14.0V IN
2	GND
1	METER MUTE IN

O from MAIN P. B

3	MAIN Indicate Command IN
1	J BAR Indicate Command IN

A from MECHANISM CONTROL P. B

1	
2	
3	Digital Counter In
4	
5	min/sec/repeat Indication Command IN

B from MECHANISM CONTROL P. B

1	
2	
3	
4	
5	Digital Counter In
6	
7	

C from MUTING CONTROL P. B

1	Play EQ Change Sig. OUT
2	+ 13.5V IN
3	+ 5.0V IN
4	GND
5	− 14.0V IN
6	REC Command OUT
7	50/60 Hz IN
8	PLAY Command IN

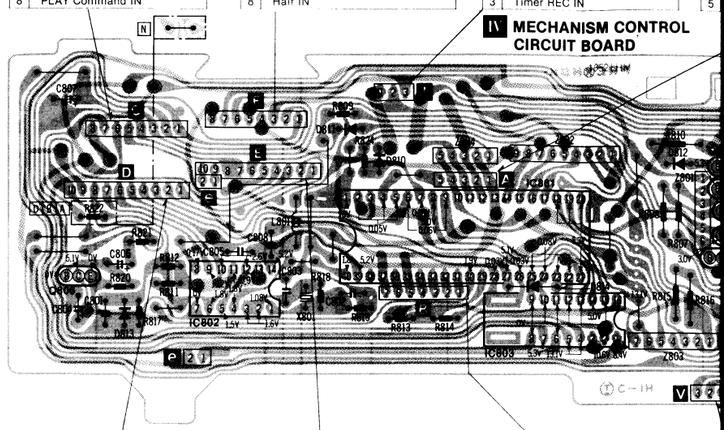
F from MUTING CONTROL P. B

1	Trigger Plunger Control Sig. OUT
2	Brake Plunger Control Sig. OUT
3	B + OUT (for Plunger/Hall IC)
4	Rec INH IN
5	Mode IN
6	Play IN
7	Stop IN
8	Half IN

I to TIMER SW P. B

1	Schan Sig. OUT
2	Timer Play Command IN
3	Timer REC IN

IV MECHANISM CONTROL CIRCUIT BOARD



D from MUTING CONTROL P. B

1	Tape Selector OUT
2	Tape Selector OUT
3	BIAS OSC. ON/OFF OUT
4	MUTE OUT
5	RESET OUT
6	50/60Hz OUT
7	Music Selector IN
8	REC MUTE OUT
9	PAUSE
10	+ 10.5V IN

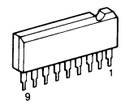
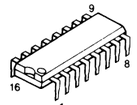
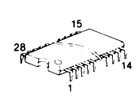
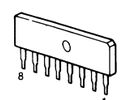
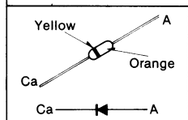
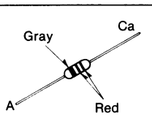
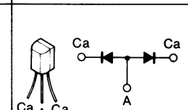
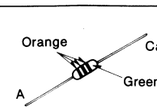
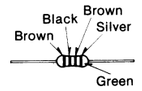
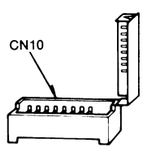
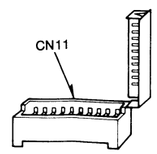
E to MECHANISM P.B

1	Tape Selector IN
2	Tape Selector IN
3	B + OUT
4	MOTOR OUT
5	Switching Schan OUT (Mecha mode)
6	Rotary Detection IN
7	GND
8	GND
9	
10	Reel Motor Contorl Sig. OUT

B from FL METER P. B

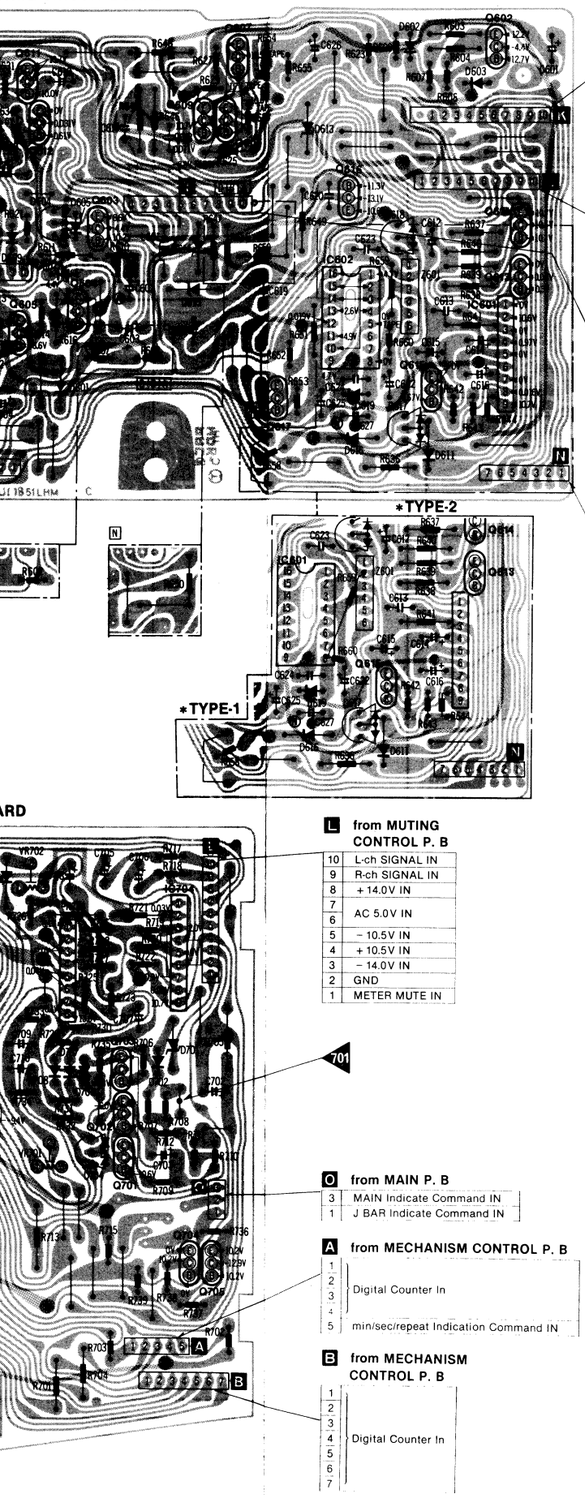
1	
2	
3	
4	Digital Counter OUT
5	
6	
7	

TERMINATIONS & CONNECTORS

 IC601, 704	 IC602, 701, 702, 803	 IC703	 IC705	
 D501–503, 602, 603, 605–607, 609–611, 616, 702, 703, 706–708, 810–814	 D601, 701	 D604, 608, 617, 618, 704	 D613	
L501, 502	 L801			

FL Meter/Mechanism Control/Muting Control/Key Board Circuit Boards)

TROL CIRCUIT BOARD



K to SLIDE VOLUME P. B

1	− 10.5V OUT
2	SOURCE LED OUT
3	TAPE LED OUT
4	R-ch VR out OUT
5	R-ch VR in OUT
6	GND
7	L-ch VR in OUT
8	L-ch VR out OUT
9	Tape/Source Change Sig.
10	GND

L to FL METER P. B

1	METER MUTE OUT
2	GND
3	− 14.0V OUT
4	+ 10.5V OUT
5	− 10.5V OUT
6	
7	AC 5.0V OUT
8	+ 14.0V OUT
9	R-ch SIGNAL OUT
10	L-ch SIGNAL OUT

T from POWER SUPPLY P. B

1	+ 5.0V IN
2	+ 13.5V IN
3	50/60Hz IN
4	GND
5	+ 10.5V IN
6	+ 14.0V IN
7	− 14.0V IN
8	− 10.5V IN
9	
10	AC 5.0V IN

N from MAIN P. B

1	R-ch VR out IN
2	R-ch VR in OUT
3	GND
4	GND
5	L-ch VR out IN
6	L-ch VR in OUT
7	GND

ARD

L from MUTING CONTROL P. B

10	L-ch SIGNAL IN
9	R-ch SIGNAL IN
8	+ 14.0V IN
7	
6	AC 5.0V IN
5	− 10.5V IN
4	+ 10.5V IN
3	− 14.0V IN
2	GND
1	METER MUTE IN

O from MAIN P. B

3	MAIN Indicate Command IN
1	J BAR Indicate Command IN

A from MECHANISM CONTROL P. B

1	
2	
3	Digital Counter In
4	
5	min/sec/repeat Indication Command IN

B from MECHANISM CONTROL P. B

1	
2	
3	
4	Digital Counter In
5	
6	
7	

C from MUTING CONTROL P. B

1	Play EQ Change Sig. OUT
2	+ 13.5V IN
3	+ 5.0V IN
4	GND
5	− 14.0V IN
6	REC Command OUT
7	50/60Hz IN
8	PLAY Command IN

F from MUTING CONTROL P. B

1	Trigger Plunger Control Sig. OUT
2	Brake Plunger Control Sig. OUT
3	B + OUT (for Plunger/Hall IC)
4	Rec INH IN
5	Mode IN
6	Play IN
7	Stop IN
8	Half IN

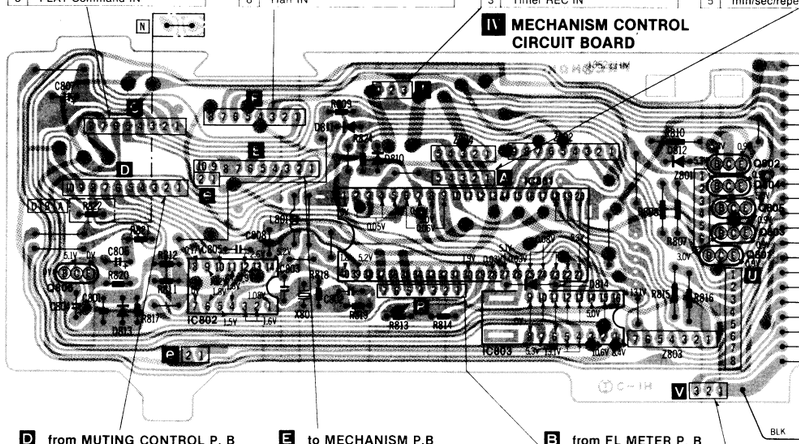
I to TIMER SW P. B

1	Schan Sig. OUT
2	Timer Play Command IN
3	Timer REC IN

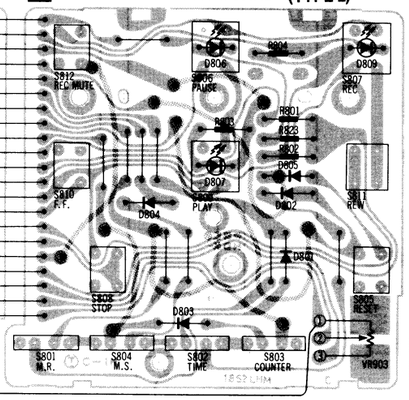
A to FL METER P. B

1	
2	
3	Digital Counter OUT
4	
5	min/sec/repeat Indication Command OUT

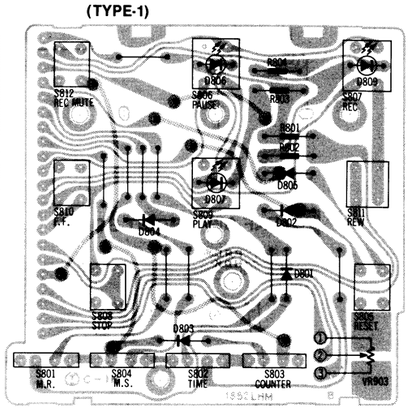
M MECHANISM CONTROL CIRCUIT BOARD



V KEY BOARD CIRCUIT BOARD (TYPE-2)



(TYPE-1)



D from MUTING CONTROL P. B

1	Tape Selector OUT
2	Tape Selector OUT
3	BIAS OSC. ON/OFF OUT
4	MUTE OUT
5	RESET OUT
6	50/60Hz OUT
7	Music Selector IN
8	REC MUTE OUT
9	PAUSE
10	+ 10.5V IN

E to MECHANISM P.B

1	Tape Selector IN
2	Tape Selector IN
3	B + OUT
4	MOTOR OUT
5	Switching Schan OUT (Mecha mode)
6	Rotary Detection IN
7	GND
8	GND
9	
10	Reel Motor Contorl Sig. OUT

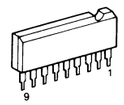
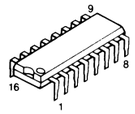
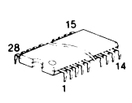
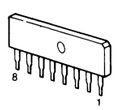
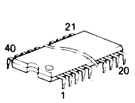
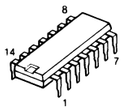
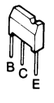
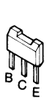
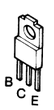
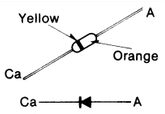
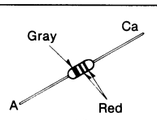
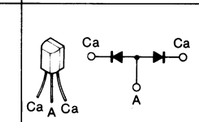
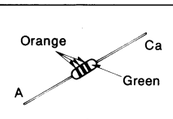
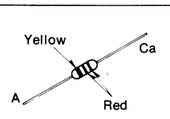
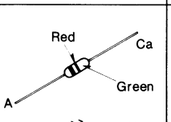
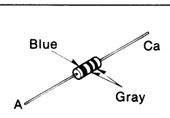
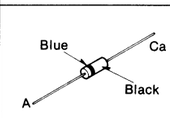
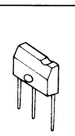
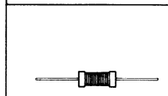
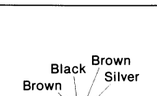
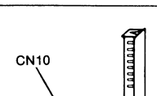
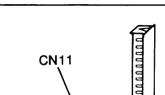
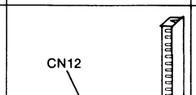
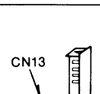
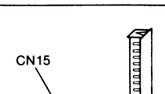
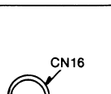
B from FL METER P. B

1	
2	
3	
4	Digital Counter OUT
5	
6	
7	

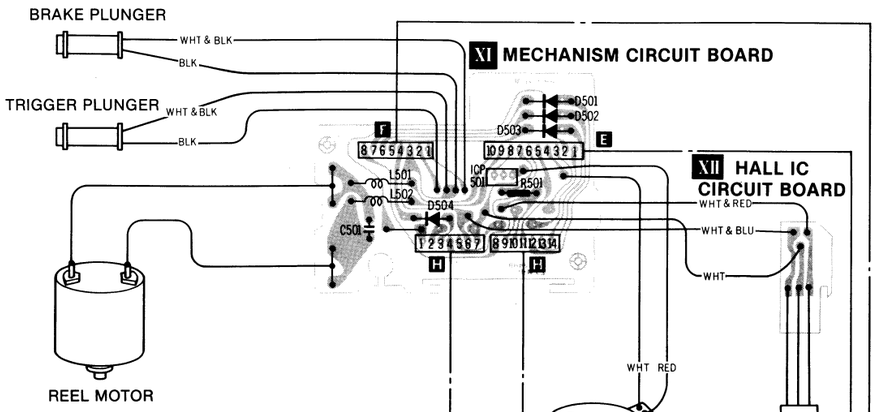
V to MECHANISM CONTROL P. B

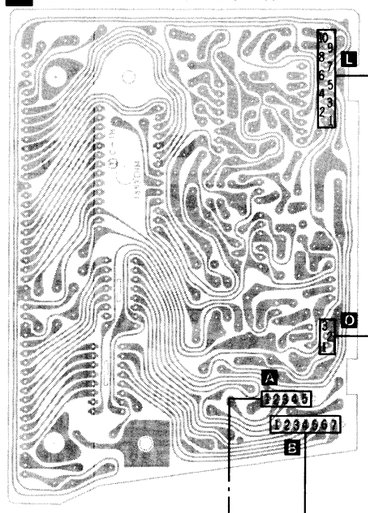
3	BIAS ADJUST OUT
2	BIAS ADJUST IN
1	Power IN (for Bias Adjust)

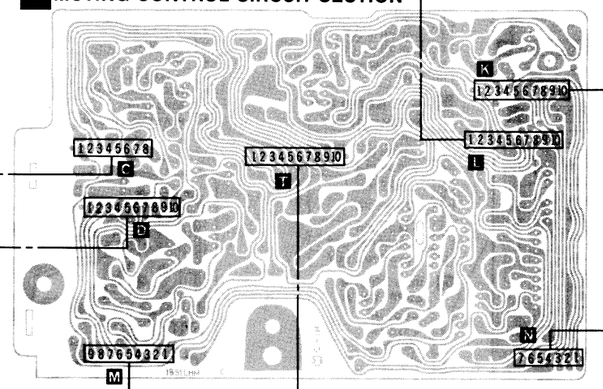
TERMINATIONS & CONNECTORS

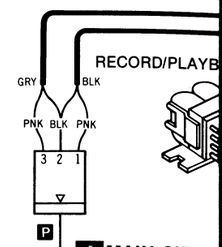
 IC601, 704	 IC602, 701, 702, 803	 IC703	 IC705	 IC801	 IC802	 Q602~606, 609~615, 617, 701~705, 801~806	 Q607, 608	 Q851, 853
 D501~503, 602, 603, 605~607, 609~611, 616, 702, 703, 706~708, 810~814	 D601, 701	 D604, 608, 617, 618, 704	 D613	 D614	 D615	 D851, 854	 D853, 855~859	 ICP501
 L501, 502	 L801	 CN10	 CN11	 CN12	 CN13	CN14	 CN15	 CN16

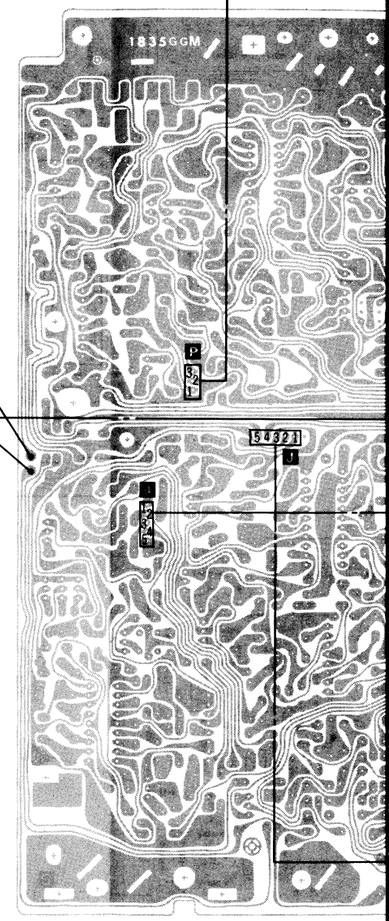
WIRING CONNECTION DIAGRAM

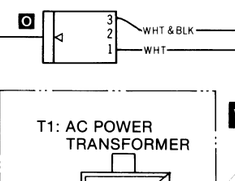


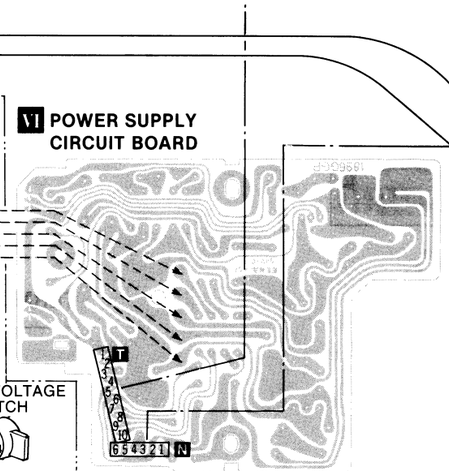




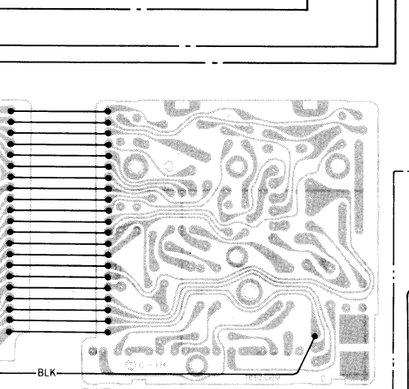


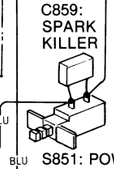


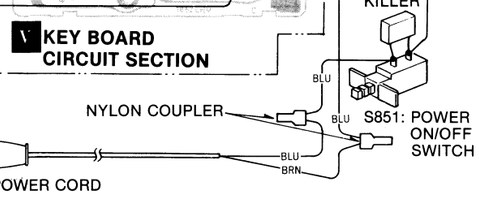




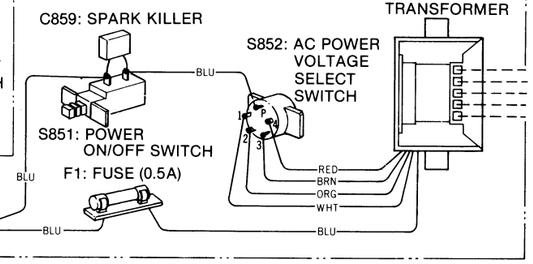
* For Asia, Latin America, Middle East and Africa areas.

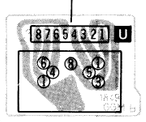






* For all European areas and Australia.



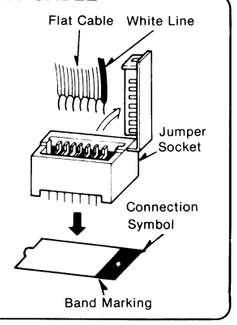


NOTES:

BLK .....Black
BLU .....Blue
BRN.....Brown
GRY.....Gray
GRN .....Green
L. BLU ....Light Blue
NIL.....No Color Mark
ORG .....Orange
PNK.....Pink
RED.....Red
SLD .....Shield Wire
VLT.....Violet
WHT.....White
YEL.....Yellow

CONNECTION OF A FLAT CABLE

Connect the flat cable to the jumper socket so that the white line on the flat cable corresponds to the band mark side of the connection symbol (yellow or white symbol on the PC board) for the jumper socket. (This connection may differ from those for conventional models.)



II FL METER CIRCUIT BOARD

III MUTING CONTROL CIRCUIT SECTION

RECORD/PLAYBACK HEAD

ERASE HEAD

XIII LED CIRCUIT BOARD

I MAIN CIRCUIT BOARD

VI POWER SUPPLY CIRCUIT BOARD

T1: AC POWER TRANSFORMER

S852: AC POWER VOLTAGE SELECT SWITCH

C859: SPARK KILLER

S851: POWER ON/OFF SWITCH

F1: FUSE (0.5A)

NYLON COUPLER

AC POWER CORD

* For Asia, Latin America, Middle East and Africa areas.

* For all European areas and Australia.

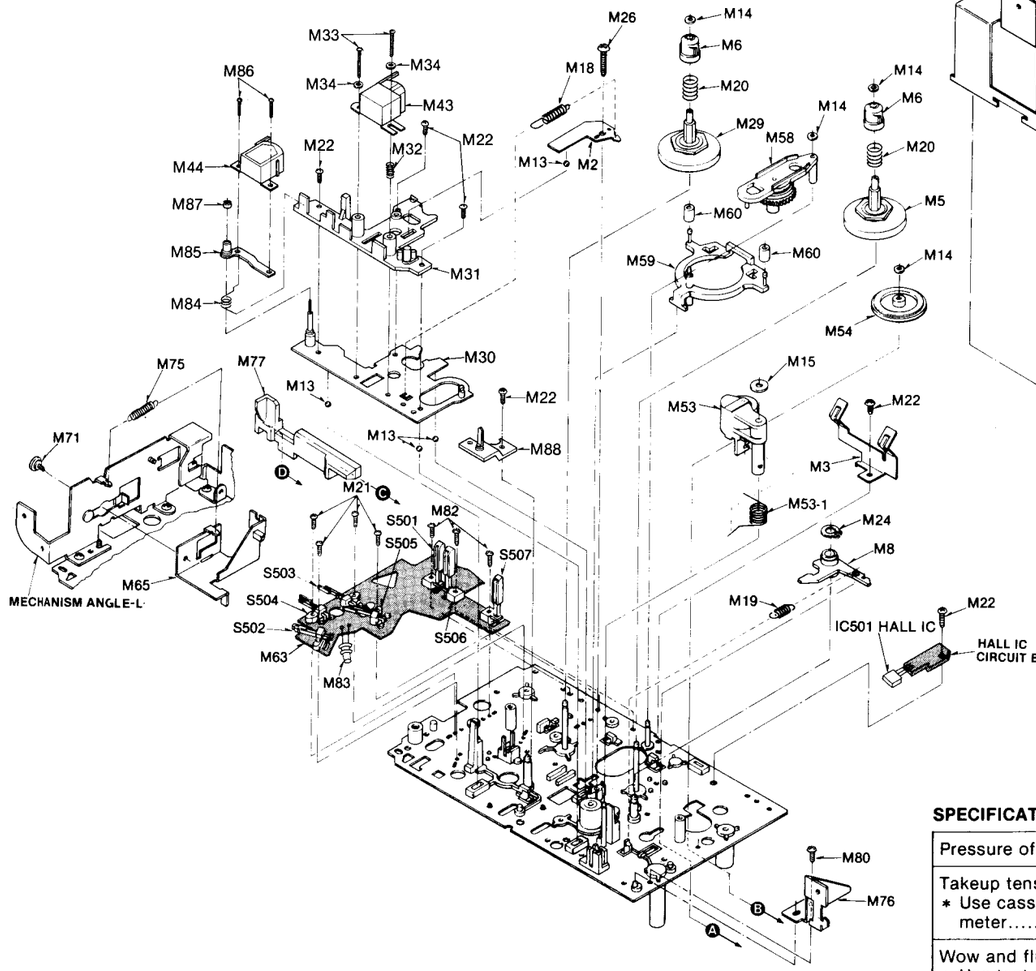
V KEY BOARD CIRCUIT SECTION

VII SLIDE VOLUME CIRCUIT BOARD

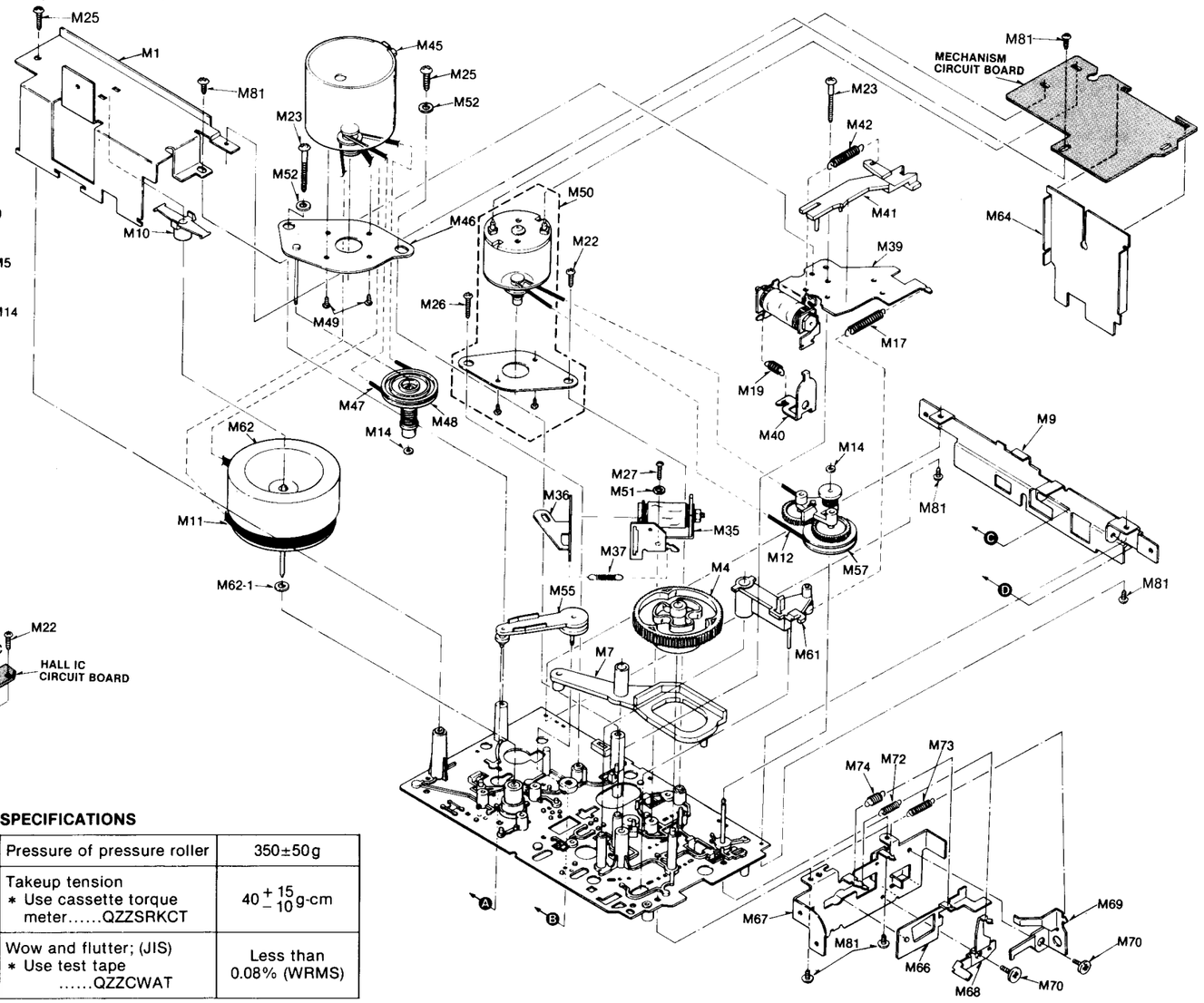
VIII HEADPHONES CIRCUIT BOARD

MECHANICAL PARTS LOCATION

(Front View)



(Rear View)



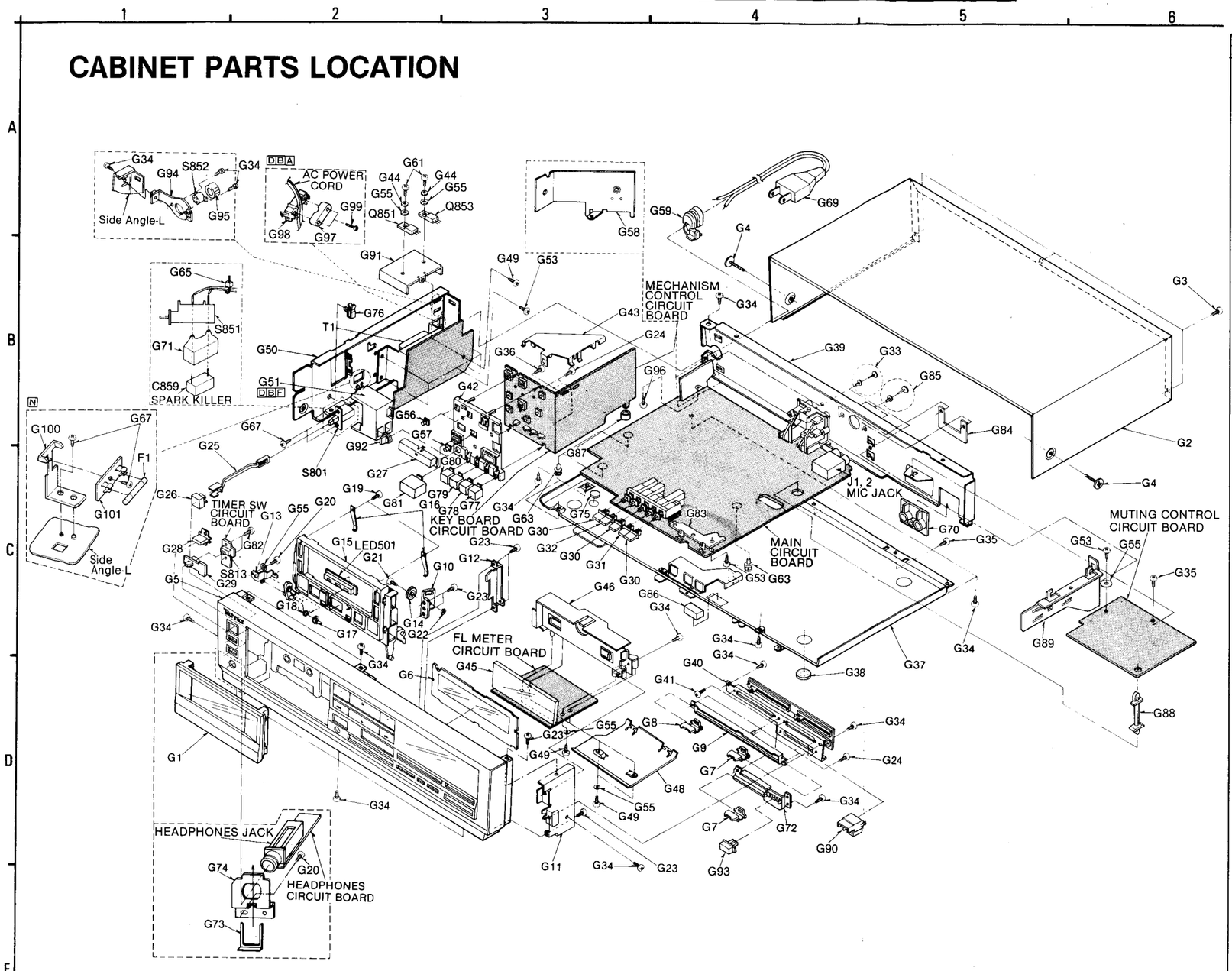
SPECIFICATIONS

Pressure of pressure roller	350±50g
Takeup tension * Use cassette torque meter.....QZZSRKCT	40^{+15}_{-10} g-cm
Wow and flutter; (JIS) * Use test tape .....QZZCWAT	Less than 0.08% (WRMS)

REPLACEMENT PARTS LIST

Ref. No.	Part No.	Part Name & Description
		MECHANIAL PARTS
M 1	QMA4528	Flywheel Retainer
M 2	QBP1894	Head Base Plate Spring
M 3	QBP1979	Cassette Pressure Spring
M 4	QXG1059	Main Gear Assembly
M 5	QXD0147	Takeup Reel Table
M 6	QMB1336	Reel Table Hub
M 7	QML3655	Cam Follower
M 8	QML3660	Idler Select Lever
M 9	QMA4543	Mechanism Upper Angle
M 10	QMZ1293	Flywheel Thrust Retainer
M 11	QDB0333	Flywheel Belt
M 12	QDB0287	Changing Belt
M 13	QDK1012	Steel Ball 2.5φ
M 14	QBW2008	Snap Washer
M 15	QBW2046	Snap Washer
M 17	QBT1725	Lock Lever Spring
M 18	QBT1927	Head Base Plate Spring
M 19	QBT1920	Idler Spring
M 20	QBC1373	Reel Table Spring
M 21	XTN2+6B	Tapping Screw ⊕2×6
M 22	XTN26+6B	Tapping Screw ⊕2.6×6
M 23	XTN3+24B	Tapping Screw ⊕3×24
M 24	XUB4FT	Stop Ring 4φ
M 25	XTN3+10B	Tapping Screw ⊕3×10
M 26	XTN26+12B	Tapping Screw ⊕2.6×12
M 27	XTN26+8B	Tapping Screw ⊕2.6×8
M 29	QDR1164	Supply Reel Table
M 30	QXK2765	Head Base Plate
M 31	QXZ1303	Spacer
M 32	QBC1103	Spring (for R/P Head)
M 33	XSN2+14	Screw ⊕2×14
M 34	XWG2	Washer 2φ
M 35	QXA1232	Brake Plunger Assembly
M 36	QML3865	Plunger Lever
M 37	QBT1955	Plunger Spring
M 39	QXA1076	Trigger Plunger Assembly
M 40	QML3651	Trigger Plunger Lever
M 41	QML3653	Control Lever
M 42	QBT1278	Record Lock Lever Spring
M 43	QWY4148Z	Record/Playback Head
M 44	QWY2133Z	Erase Head
M 45	QXU0322	Capstan Motor Assembly
M 46	QXA1328	Motor Retainer Assembly
M 47	QDB0332	Takeup Belt
M 48	QXP0621	Takeup Pulley Assembly
M 49	XSN26+3	Screw ⊕2.6×3
M 50	QXU0334	Reel Motor Assembly
M 51	XWG26	Washer 2.6φ
M 52	XWG3	Washer 3φ
M 53	QXL1550	Pressure Roller Assembly
M 53-1	QBN1771	Pressure Roller Spring
M 54	QXi0113	Takeup Idler Assembly
M 55	QXL1603	Idler Lever Assembly
M 56	XTN3+6B	Tapping Screw ⊕3×6
M 57	QXL1408	Swing Gear Assembly
M 58	QXL1604	Fast Wind Gear Assembly
M 59	QML3659	Brake Lever
M 60	QBG1132	Brake Rubber
M 61	QXL1411	Lock Lever Assembly
M 62	QXF0219	Flywheel Assembly
M 62-1	QBW2099	Poly Washer
M 63	QJi1776RR	Leaf Switch P.C.B.
M 64	QTW1315	Insulating Plate
M 65	QXL1600	Lock Lever-C Assembly
M 66	QXL1601	Lock Lever-B Assembly
M 67	QMA4623	Mechanism Angle-L
M 68	QML3976	Eject Lever
M 69	QML3978	Mechanism Lever-A
M 70	QHQ1161	Step Screw
M 71	QHQ1168	Step Screw
M 72	QBT2001	Eject Lever Spring
M 73	QBT1998	Lock Lever-A Spring
M 74	QBT1999	Lock Lever-B Spring
M 75	QBT2000	Lock Lever-C Spring
M 76	QMA4554	Mechanism Angle-R
M 77	QML3972	Auto Tape Select Lever
M 80	XTN26+8B	Tapping Screw ⊕2.6×8
M 81	XTN3+6B	Tapping Screw ⊕3×6
M 82	XTN2+8B	Tapping Screw ⊕2×8
M 83	XAMQ50S12	Pilot Lamp
M 84	QBN1981	Spring (for Erase Head)
M 85	QXH0437	Erase Head Base Plate Assembly
M 86	XSN2+4	Screw ⊕2×4
M 87	QNQ1094	Nut
M 88	QXH0434	Pad Cradle Assembly

CABINET PARTS LOCATION

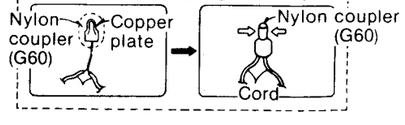


NOTES:

- [D] .....For all European areas except United Kingdom.
- [B] .....For United Kingdom.
- [N] .....For Asia, Latin America, Middle East and Africa areas.
- [A] .....For Australia.

[DBA]

Note: Cord connection using this nylon coupler (G60) reguires a special tool.



REPLACEMENT PARTS LIST

Important safety notice
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

Ref. No.	Part No.	Part Name & Description
	CABINET PARTS	
G 1	QYF0641 "Silver Type"	Cassette Lid Assembly
	QYF0641K "Black Type"	Cassette Lid Assembly
G 2	QGC1239 "Silver Type"	Case Cover
	QGC1239 "Black Type"	Case Cover
G 3	XTB3+8BFN "Silver Type"	Tapping Screw ⊕3×8
	XTB3+8BFZ "Black Type"	Tapping Screw ⊕3×8
G 4	QHQ1349 "Silver Type"	Ornament Screw
	QHQ1349K "Black Type"	Ornament Screw
G 5	QYP1189 "Silver Type"	Front Panel Assembly
	QYP1189K "Black Type"	Front Panel Assembly
G 6	QGL1181 "Silver Type"	FL Meter Cover
	QGL1181K "Black Type"	FL Meter Cover
G 7	QYT0657	Slide Knob-A Assembly
G 8	QYT0658	Slide Knob-B Assembly
G 9	QGG0208 "Silver Type"	Slide Guide-A
	QGG0208K "Black Type"	Slide Guide-A
G 10	QKJ0596	Damper Gear Holding Angle
G 11	QMA4636	Side Angle-R
G 12	QMA4610	Meter Holding Angle
G 13	QMA4552	Cassette Holder Angle-L
G 14	QDG1254	Damper Gear
G 15	QMH2098 "Silver Type"	Cassette Holder
	QMH2098K "Black Type"	Cassette Holder
G 16	QBP1946	Cassette Pressure Spring
G 17	XUBQ4FT	Stop Ring
G 18	QBN1961	Holder Spring
G 19	XTN26+5BFZ	Screw ⊕2.6×5
G 20	XTN3+8B	Tapping Screw ⊕3×8
G 21	XSN26+10	Screw ⊕2.6×10
G 22	XNG26E	Nut 2.6ϕ
G 23	XTB3+10BFN	Tapping Screw ⊕3×10
G 24	XTN26+8B	Tapping Screw ⊕2.6×8
G 25	QMR2059	Power Rod
G 26	QGO2142	Push Button (Power ON/OFF)
G 27	QGO2140	Push Button (STOP)
G 28	QGO2141	Push Button (for Eject)
G 29	QGT1642	Timer Switch Knob
G 30	QGO2145	Push Button-A
G 31	QGO2146	Push Button-B
G 32	QGO2147	Push Button-C
G 33	QKJ0609	Nylon Rivet
G 34	XTB3+8BFN	Tapping Screw ⊕3×8
G 35	XTB3+12BFZ	Tapping Screw ⊕3×12
G 36	XTB3+12BFN	Tapping Screw ⊕3×12
G 37	QGC1240	Bottom Cover
G 38	QKA1086	Case Foot
G 39 [D]	QMK2054	Back Chassis
[For all European areas except United Kingdom.]		
[BA]	QMK2055	Back Chassis
[For United Kingdom and Australia.]		
[N]	QMK2056	Back Chassis
[For Asia, Latin America, Middle East and Africa areas.]		
G 40	QMA4611	Volume Angle
G 41	XSN2+3	Screw ⊕2×3
G 42	QMK2036	Operation Chassis
G 43	QMA4558	P.C.B Angle
G 44	XWA3B	Washer 3ϕ
G 45	QSiFM006F	FL Meter
G 46	QKJ0632	Meter Holder
G 48	QTS1602	FL Meter Shild Plate
G 49	XTN3+10B	Tapping Screw ⊕3×10
G 50	QMA4635	Side Angle-L
G 51		
[DBA]	QKJ0598	Switch Cover (for S851)
[For all European areas and Australia.]		
G 53	XTN3+6B	Tapping Screw ⊕3×6
G 54	XWG26	Washer 2.6ϕ
G 55	XWG3	Washer 3ϕ
G 56	QKJ0634	LED Cover-A
G 57	QKJ0635	LED Cover-B
G 58	QTH1178	Heat Sink
G 59		
[DBA]	QBJ1425	Cord Bushing
[For all European areas and Australia.]		
[N]	QTD1129	Cord Bushing
[For Asia, Latin America, Middle East and Africa areas.]		
G 60		
[DBA] ⚠	QJT1079	Nylon Coupler
[For all European areas and Australia.]		
G 61	XSN3+8S	Screw ⊕3×8
G 63	QKJ0608	Spacer (for P.C.B)
G 65	QTD1315	Nylon Binder
G 67	XTN3+6B	Tapping Screw ⊕3×6
G 69		
[D] ⚠	SJA88	AC Power Cord
[For all European areas except United Kingdom.]		
[B] ⚠	QFC1205M	AC Power Cord
[For United Kingdom.]		
[N] ⚠	RJA52ZB-K	AC Power Cord
[For Asia, Latin America, Middle East and Africa areas.]		
[A] ⚠	QFC1208M	AC Power Cord
[For Australia.]		
G 70	QGK3355	MIC Cover
G 71	QTW1195	Spark Killer Cover
G 72	QGG0218 "Silver Type"	Slide Guide-B
	QGG0218K "Black Type"	Slide Guide-B
G 73	QMA4624	Headphones Holding Plate
G 74	QMA4614	Headphones Angle
G 75	QTW1336	Insulator Sheet
G 76	QKJ0648	Cord Clamper
G 77	QGO2211	Push Button (Repeat)
G 78	QGO2214	Push Button (Music Select)
G 79	QGO2213	Push Button (Time Counter)
G 80	QGO2212	Push Button (Tape Counter)
G 81	QGO2210	Push Button (Counter Reset)
G 82	XTN26+6B	Tapping Screw ⊕2.6×6
G 83	QMA4613	P.B Holding Angle (A)
G 84	QMA4645	Remote Control Angle
G 85	QKJ0661	Nylon Rivet
G 86	QBM1333	Rubber Cushion
G 87	QBM1332	Cap
G 88	QKJ0637	Locking Support
G 89	QMA4615	P.B Holding Angle (B)
G 90	QKJ0633	LED Holding
G 91	QTH1179	Heat Shink
G 92	QGT1643	Bias Adjustment Knob
G 93	QGO2215	Push Button (Monitor)
G 94	QMA4603	Switch Angle (for S852)
G 95	QTWM0026	Switch Cover (for S852)
G 96	XSN+6BVD	Screw ⊕3×6
G 97		
[DBA]	QTD1164	Cord Clamper-A
[For all European areas and Australia.]		
G 98		
[DBA]	QTD1322	Cord Clamper-B
[For all European areas and Australia.]		
G 99		
[DBA]	XTN3+24B	Tapping Screw ⊕3×24
[For all European areas and Australia.]		
G 100		
[N]	QMA3418	Fuse Angle
[For Asia, Latin America, Middle East and Africa areas.]		
G 101		
[N] ⚠	QTF1032	Fuse Holder
[For Asia, Latin America, Middle East and Africa areas.]		
	ACCESSORIES	
A 1	QEB0125	Connection Cord
A 2	XZB24X34A04	Poly Bag (for A3)
A 3	QQT3475	Instruction Book
A 4 [N] ⚠	QJP0603S	AC Plug Adaptor
[For Asia, Latin Aamerica, Middle East and Africa areas.]		
	PACKINGS	
P 1		
[DBA]	QPN4455	Inner Carton
[For all European areas and Australia.]		
[N]	QPN4458	Inner Carton
[For Asia, Latin Aamerica, Middle East and Africa areas.]		
P 2	QPA0701	Cushion-R
P 3	QPA0702	Cushion-L
P 4	QPS0434	Pad
P 5	QPA0712	Spacer
P 6	XZB40X60A02	Poly Bag (for UNIT)
P 7	QPC0072	Poly Sheet (for AC Power Cord)

ARD
H.M D DK B BK N NK A
Printed in Japan

ORDER NO. ARD83110318S8-01

Service Manual

Supplement-1

Cassette Deck

RS-M253X

(Silver Face / Black Face)

dbx* /Dolby B-C 2 Motor 3 Head Cassette Deck

** DOLBY B•C NR

This is the Service Manual for the following areas.

D ...For all European areas except United Kingdom.

B ...For United Kingdom.

A ...For Australia.

RS-M250 MECHANISM SERIES

Please use this manual together with the service manual for model No. RS-M253X (Original) order No. ARD83040230C8-19.

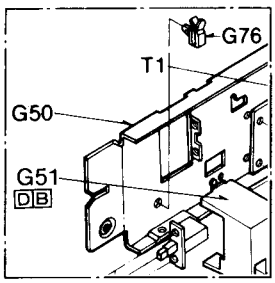
PARTS COMPARISON TABLE:

Please revise the original parts list in the Service Manual (RS-M253X) to conform to the changes shown herein.
If new part numbers are shown, be sure to use them when ordering parts.

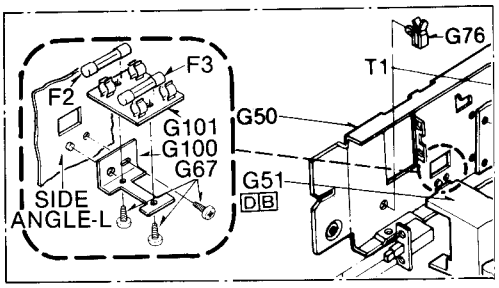
• Important safety notice
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

Ref. No.	Part Name & Description	Part Numbers		Remarks
		Former Type	**New Type**	
IC104, 105, 106, 130, 203, 204 205, 206, 302	Integrated Circuits	M5220L	**M5218L**	
F2, 3 ⚠	Fuse	——	**XBAQ100027 (T1A)**	Added
G2	Case Cover "Silver Type"	QGC1239	**QGC1245**	
G2 D B	Case Cover "Black Type"	QGC1239 ↓ Correction QGC1239K	**QGC1245K**	
※ For all European areas.				
G100	Fuse Angle	——	**QMA4729**	Added
G101 ⚠	Fuse Holder	——	**QFF1020**	Added

CABINET PARTS LOCATION (ADDITION)



Former Type



New Type

*The term dbx is a registered trademark of dbx Inc.

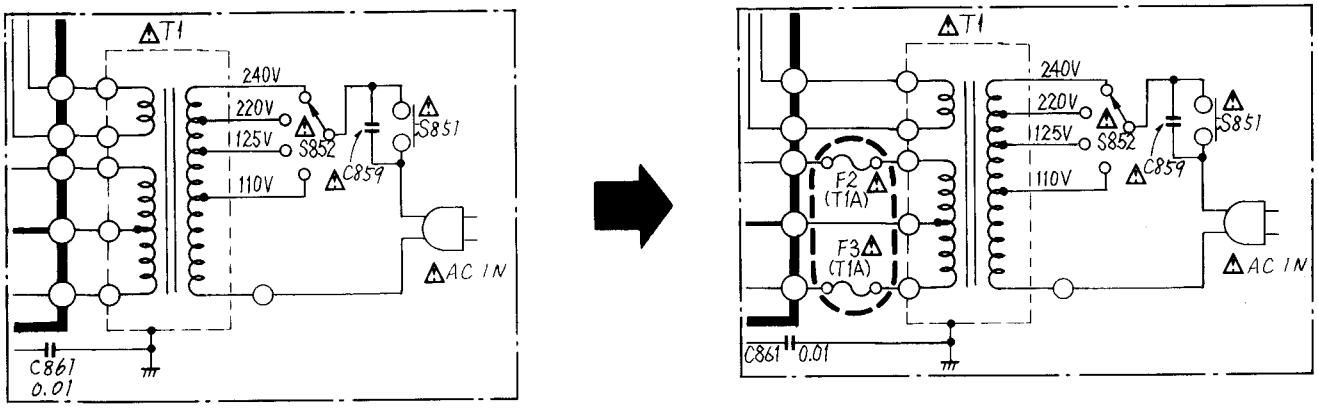
**'Dolby' and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

SCHEMATIC DIAGRAM (Power Supply Circuit Section)

(ADDITION)



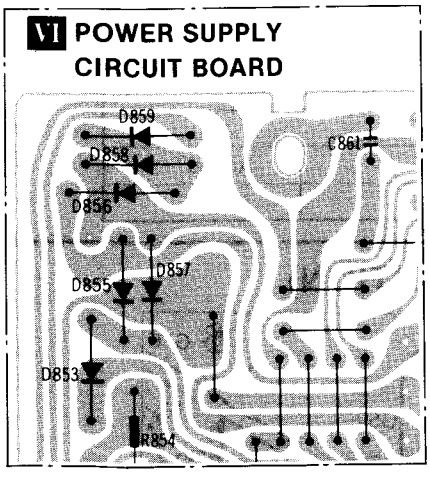
Former Type

New Type

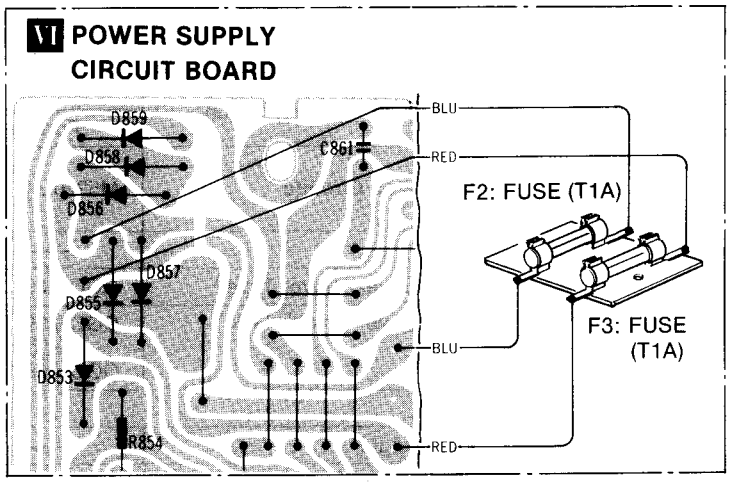
CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM

NOTES: **Former Type**.....This product with serial numbers to RH303950.
New Type.....This product with serial number RH303951 and after.
• The serial number plate of this product is attached to the bottom cover.

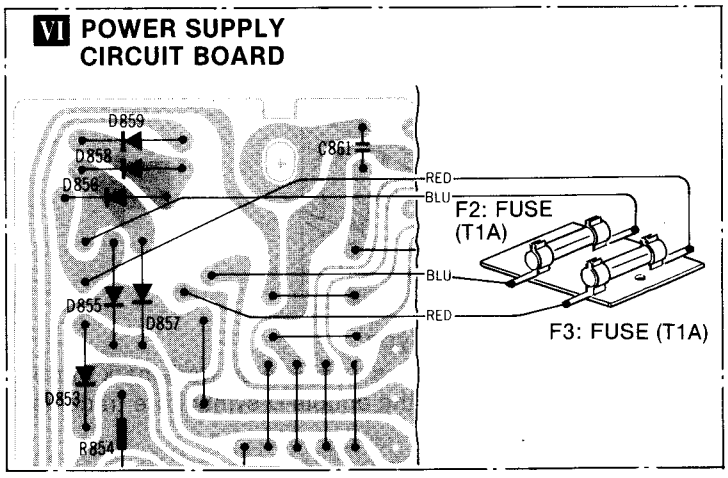
(ADDITION)



Former Type



New Type



New Type

ARD
A.H
D DK B BK A
Printed in Japan

MESSUNGEN UND EINSTELL METHODEN

RS-M253X DEUTSCH

Verwenden Sie bitte diese Broschüre Zusammen mit der Service-Anieitung für das Modell Nr. RS-M253X.

Anm.: Wenn nicht anders vorgeschrieben, Drehschalter und Steuereinrichtungen auf die folgenden Positionen stellen.
- Für saubere Köpfe sorgen.
- Für saubere Tonwelle und Andruckrolle sorgen.
- Auf normale Raumtemperatur achten: 20±5°C (68±9°F)
- Monitorschalter: Band-Position
- Eingangsregler: MAX
- Ausgangsregler: MAX
- Dolby-Schalter: AUS
- Vormagnetisierungsfeineinstellung: Mitte
- Balanceregler: Mitte

Ⓐ **Einstellung der Löschkopfhöhe**	Bedingung: • Wiedergabe	Meßgerät: • Testband (Bandlaufweg-Betrachtungsvorrichtung mit Spiegel)...QZZCRD

Vorsicht:
1. Die Schrauben (A) und (B) lösen und den Löschkopf ersetzen.
   (Die Mutter (C) dient zur Einstellung der Löschkopfhöhe und darf nicht gelöst werden.)
2. Nachdem der Löschkopf ausgewechselt wurde, das Testband QZZCRD abspielen.
3. Sollten irgendwelche Probleme beim Bandtransport auftreten, ist auf unten beschriebene Weise die Einstellung vorzunehmen.

Einstellung:
1. Die Mutter (C) (siehe Fig. 2) so justieren, daß das Band sich nicht verwickelt oder von der Bandführung des Löschkopfes verzogen wird.

Kopfhöheneinstellung mit der Kopfeinstellungsvorichtung (QZZ0207)

Die Kopfeinstellungsvorichtung (QZZ0207) ermöglicht schnelles und genaues Einstellen der Kopfhöhe, wie im Folgenden beschrieben:
a. Die Grundplatte auf den Mechanismus aufsetzen.
b. Auf Wiedergabe (Play) schalten.
c. Prüfstab auf die Grundplatte setzen.
d. Den Prüfungsstab durch die Bandführungen führen.
e. Den Nut so justieren, dass der Prüfstab die Bandführungen nicht berührt.
f. Mit dem Testband (QZZCRD) überprüfen, ob das Band die Bandführungen nicht berührt.
   (z.B.: Das Band darf nicht verdreht werden).

Ⓑ **Justierung des Aufnahme/ Wiedergabekopfes**	Bedingung: • Wiedergabe • Betriebsart: Normalband • Ausgangsregler: MAX	Meßgerät: • Röhrenvoltmeter • Oszillograph • Testband (azimuth)...QZZCFM

Ausgangsbalance-Justierung für linken und rechten Kanal
1. Den Meßaufbau zeigt Fig. 4.
2. 8kHz-Signal des Testbandes (QZZCFM) wiedergeben.
   Schraube (D) in Fig. 5 auf maximalen Ausgangspegel des linken und rechten Kanals abgleichen.
   Sind die Ausgangspegel des linken und rechten Kanals nicht gleichzeitig maximal, wie folgt justieren:
3. Durch Drehen der in Fig. 5 gezeigten Schraube (D) die Winkel A and C (Punkte, wo Spitzenausgangspegel für den linken und rechten Kanal erreicht werden) ermitteln. Anschließend den Winkel B zwischen dem Winkel A und C ermitteln, d.h. den Punkt, wo die Ausgangspegel des linken und rechten Kanals ausbalanciert (ausgeglichen) sind. (Siehe Fig. 5 und 6.)

Phasenjustierung für linken und rechten Kanal
4. Den Meßaufbau zeigt Fig. 7.
5. 8kHz-Signal des Testbandes (QZZCFM) wiedergeben.
   Schraube (D), wie in Fig. 5 gezeigt, so einstellen, daß Zeiger von zwei Röhrenvoltmeter auf Maximum ausschlagen und am Oszillographen eine Wellenform wie in Fig. 8 erreicht wird.

Ⓒ Bandgeschwindigkeit

Bedingung:
- Wiedergabe
- Ausgangsregler: MAX

Meßgerät:
- Elektronischer Digitalzähler
- Testband...QZZCWAT

Genauigkeit der Bandgeschwindigkeit

1. Den Meßaufbau zeigt Fig. 9.
2. Testband (QZZCWAT 3000 Hz) wiedergeben und Ausgangssignal dem Zähler zuführen.
3. Frequenz messen.
4. Beträgt die auf dem Testband aufgezeichnete Frequenz 3000 Hz, so ergibt sich die Genauigkeit nach folgender Formel:

$$\text{Genauigkeit der Bandgeschwindigkeit} = \frac{f-3000}{3000} \times 100(\%)$$

worin f die gemessene Frequenz ist.

5. Die Messung soll im mittleren Teil des Bandes erfolgen.

NORMALWERT: ±1,5%

6. Falls der Meßwert nicht im vorgeschriebenen Bereich liegt, bitte mit Bandgeschwindigkeitsregler VR wie in Abb. 1 gezeigt einstellen.

Anmerkung: Bitte bei dieser Einheit zum Justieren der Bandgeschwindigkeit keinen Metallschraubenzieher benutzen.

Schwankung der Bandgeschwindigkeit:

Messung, wie oben beschrieben für Anfang, mittleren Teil und Ende des Testbandes wiederholen und Schwankung wie folgt bestimmen:

$$\text{Schwankung} = \frac{f_1-f_2}{3000} \times 100(\%)$$

f_1 = Maximalwert
f_2 = Minimalwert

NORMALWERT: 1,0%

Ⓓ Frequenzgang bei Wiedergabe

Bedingung:
- Wiedergabe
- Betriebsart: Normalband
- Ausgangsregler: MAX

Meßgerät:
- Röhrenvoltmeter
- Oszillograph
- Testband...QZZCFM

1. Den Meßaufbau zeigt Fig. 4.
2. Gerät auf Wiedergabe schalten. Frequenzgang-Testband QZZCFM wiedergeben.
3. Ausgangsspannung bei 315 Hz, 12,5 kHz, 8 kHz, 1 kHz, 250 Hz, 125 Hz und 63 Hz messen und jede Ausgangsspannung mit der Standardfrequenz 315 Hz am Testpunkt [TP201 (L-CH), TP202 (R-CH)] vergleichen.
4. Messungen an beiden Kanälen durchführen.
5. Prüfen, ob die gemessenen Werte innerhalb des in der Frequenzgang-Übersicht aufgeführten Bereichs liegen. (Siehe Fig. 10.)

Ⓔ Wiedergabe-Verstärkung

Bedingung:
- Wiedergabe
- Betriebsart: Normalband
- Ausgangsregler: MAX

Meßgerät:
- Röhrenvoltmeter
- Oszillograph
- Testband...QZZCFM

1. Den Meßaufbau zeigt Fig. 4.
2. Standard-Frequenz (QZZCFM 315 Hz) vom Testband wiedergeben und Ausgangsspannung messen. [TP201 (L-CH), TP202 (R-CH)].
3. Messung an beiden Kanälen durchführen.

NORMALWERT: 0,28 V [0,4±0,05 V: at LINE OUT Jack]

Einstellung:

1. Abweichungen können durch Abgleich von VR1 (linker Kanal) und VR2 (rechter Kanal) korrigiert werden. (S. Fig. 1.)
2. Nach erfolgtem Abgleich ist der Frequenzgang bei Wiedergabe erneut zu kontrollieren.

Ⓕ Löschstrom

Bedingung:
- Aufnahme
- Betriebsart: Metallband
- Vormagnetisierungs-Feineinstellregler: Mittelstellung

Meßgerät:
- Röhrenvoltmeter
- Oszillograph

1. Den Meßaufbau zeigt Fig. 11.
2. Die Aufnahme-und Pausentaste drücken.
3. Den Bandwahlschalter auf Metallband-Position stellen.
4. Löschstrom nach folgender Formel emitteln:

$$\text{Löschstrom (A)} = \frac{\text{Die Spannung über beide Enden von R903}}{1\ (\text{Ohm})}$$